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FINAL ENVIRONMENTAL REPORT

NORTH SIDE DRAINWATER MANAGEMENT PLAN

U.S. DEPARTMENT OF THE INTERIOR

BUREAU OF RECLAMATION
PACIFIC NORTHWEST REGION
BOISE, IDAHO

OCTOBER 12, 1993

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U.S. Department of the Interior

Bureau of Reclamation
Pacific Northwest Region
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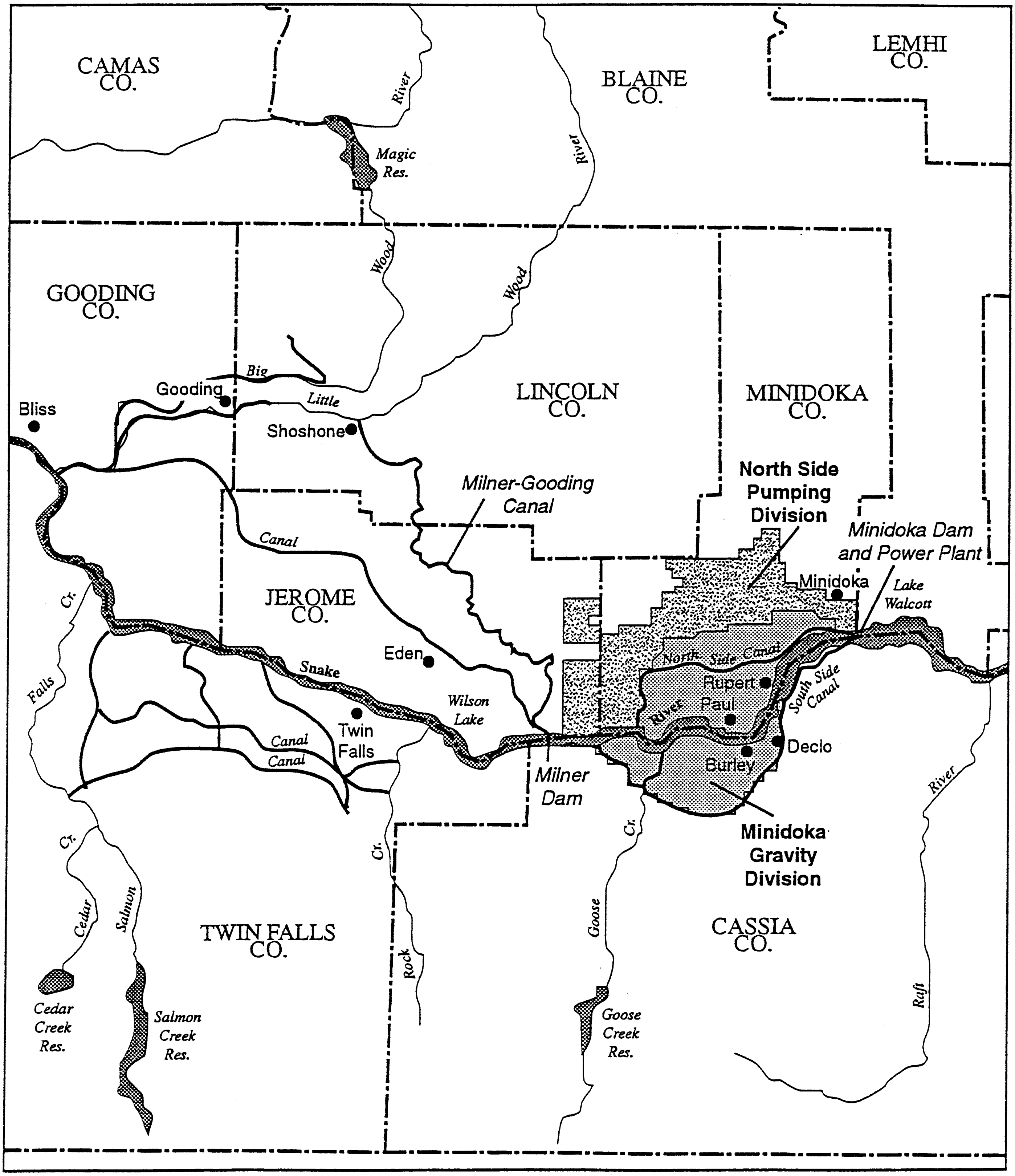
I. PURPOSE AND NEED

A. Need for the Action

The North Side Pumping Division (NSPD) is part of the U.S. Bureau of Reclamation's (Reclamation) Minidoka Project, which furnishes irrigation water to over one million acres in southern Idaho. The project works consist of five major dams, including the Minidoka Dam and power plant, as well as two diversion dams, canals, laterals, drains, and water supply wells. The NSPD is located on the southern portion of the Snake River Plain and was constructed in the 1950s. Since 1966, it has been operated by the A & B Irrigation District (ABID). The NSPD consists of 76,796 acres on a slightly elevated belt of land to the north and west of the Minidoka Project's Gravity Division (see Figure 1-1), operated by the Minidoka Irrigation District (MID).

The NSPD has two distinct land areas, referred to as Units A and B. Lands within the 14,637 acre Unit A are irrigated by pumping water from the Snake River, while the 62,159 acres comprising Unit B are irrigated by pumping groundwater from deep wells. Figure 1-2 (see page 1-11) illustrates the locations of production and drainwells within the jurisdiction of ABID. The lack of natural surface drainage outlets to the Snake River and constraints associated with drainage into the lower-lying MID, require most irrigation return flows and stormwater from Unit B (also known as the groundwater unit) to be disposed of through injection drainwells. These injection drainwells were drilled into highly porous zones of the underlying lava rock, thus passing return flows and stormwater directly into the underlying eastern Snake River Plain Aquifer. One of the most productive groundwater aquifers in the world, it provides drinking water for the approximately 275,000 residents of the eastern Snake River Plain (U.S. Environmental Protection Agency 1991).



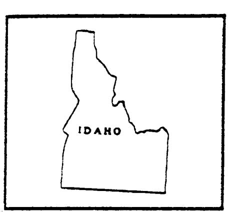
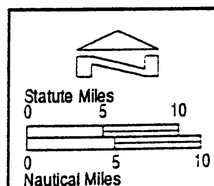


Figure 1-1

NORTH SIDE PUMPING DIVISION VICINITY MAP



After the NSPD was completed and operational responsibility was transferred to ABID, drainwells came under regulation through the Underground Injection Control (UIC) program, which was mandated by the Federal Safe Drinking Water Act. The U.S Environmental Protection Agency (EPA) designated the eastern Snake River Plain Aquifer a sole source of drinking water under provisions of the Safe Drinking Water Act in October, 1991. The EPA is required to review and approve projects in designated sole source aquifer areas that receive Federal financial assistance. Contamination of this aquifer could represent a significant hazard to public health given the size of the aquifer and the number of people it supplies.

Results of drainwater monitoring by Reclamation and ABID indicate that return flows entering selected drainwells within the NSPD commonly exceed Safe Drinking Water Act maximum contaminant levels for coliform bacteria and turbidity (Reclamation 1993a). Because of the generally poor biological and physical quality of irrigation return flows, continued injection of untreated wastewater has the potential to impact points of diversion for domestic use in the project area, and could contribute to contamination of the Snake River Plain Aquifer. Additional potential for adversely impacting aquifer water quality exists through inadvertent spills of hazardous material into area drainage facilities.

The State of Idaho ordered the closure of individual drainwells where operations were shown to result in bacteriological or chemical contamination of domestic water supplies (Reclamation 1993a). Ongoing actions by the State of Idaho to issue permits for all drainwells, and the EPA designation of the eastern Snake River Plain Aquifer as a sole source of drinking water, will likely result in increasingly more stringent water quality standards. Although several drainwells have been voluntarily closed by ABID, long-term modifications to current drainwater disposal practices are needed to reduce the potential for contamination of the Snake River Plain Aquifer and to conform with compliance requirements imposed by the State of Idaho and EPA. Appendix B provides options, developed by Reclamation in conjunction with ABID, for closing each drainwell within the NSPD (Reclamation 1993a).

Reclamation recognizes that water quality issues and associated liability to drainwell owners and operators require alternative drainwater management practices. As a result of this need, Reclamation developed a draft Drainwater Managemment Framework Plan for the NSPD. The North Side Drainwater Management Framework Plan focuses on assuring the coordinated development and management of alternatives to the current practice of discharging untreated agricultural wastewater and stormwater through drainwells directly into the Snake River Plain Aquifer. In addition to considering a no-action alternative, the plan describes two alternatives for improved drainwater management:

1) a preferred plan that integrates wetlands and irrigation reuse; and

2) an alternative plan that relies primarily on irrigation reuse, with no wetlands development.

B. Location and Description of the Affected Area

The NSPD is located in southcentral Idaho north of the Snake River. The affected area (refer to Figure 1-1) is predominantly within Minidoka County, although a small western portion is located in Jerome County. The NSPD irrigates 76,796 acres north and west of Rupert, the Minidoka County seat. The 14,637 acres that comprise Unit A are contiguous to the Snake River while 62,159 acres of Unit B lie some 3 to 8 miles distant.

Reclamation's Minidoka Dam is located on the Snake River east of the NSPD. It is a diversion and storage structure, constructed between 1904 and 1909, that impounds Lake Walcott. The Main North Side Canal heads at Minidoka Dam and serves the lands of the MID. The MID is situated between the Snake River and the southern boundary of the study area. Milner Dam, a privately owned diversion dam, is located west of the NSPD.

The affected area is situated within the Snake River Plain. It ranges from 2 to 7 miles in width and is about 30 miles long. The area is characterized by gently undulating slopes, large expanses of smooth benches and small knolls. The general topography is well suited to irrigation because of the low gradients and undissected, smooth terrain. The high permeability of the soil mantle and the porosity of the underlying rock provide excellent internal drainage, which somewhat offsets the lack of a distinct surface drainage pattern except in a number of small areas. While the Snake River itself is deeply incised, the adjacent land areas often lack well-defined stream drainage patterns and there are many isolated local catchments formed within the landscape. As a result, relatively shallow depressions with no natural surface drainage outlets act as closed basins for small to moderately sized storm events and irrigation return flows.

Within the southern portion of the Snake River Plain, precipitation is low, averaging 9 inches annually; growing season precipitation averages approximately 4 inches a year. The growing season averages 190 days during which rainfall is unpredictable; half the 4-inch total may be received in one month, and little or no rain may fall in other months. Summer temperatures are high, and winters are cold. The frost-free period averages 130 days.

The NSPD is located in a predominantly rural area. Although a small portion of the City of Burley is located in Minidoka County, nearly all of the city's population resides in Cassia County, south of the Snake River. The NSPD is comprised of agricultural lands with scattered residences and agricultural structures. Nearby communities include Rupert, Paul, Acequia, and Heyburn (refer to Figure 1-1).

C. Description of Present Operation

1. Water Distribution

NSPD construction began in 1948 and was completed by Reclamation in 1959. Operational responsibility, including the management and administration incurred with the delivery of irrigation water, was transferred to ABID on March 1, 1966. Ownership of major project facilities, including drainwells, was retained by Reclamation. A repayment contract dated

February 9, 1962, exists between ABID and Reclamation and the contract is scheduled to be paid in full on December 31, 2020.

The ABID water supply is provided by surface and groundwater sources. Water for Unit A is pumped from the Snake River at a central pump station using the pool created by Milner Dam. This pumping station is located about 8 miles west of Burley and consists of five horizontal centrifugal pumps, three with a capacity of 60 cubic feet per second (cfs), one of 40 cfs, and one of 20 cfs. They pump against a dynamic head of about 160 feet. The plant delivers water to a 4.4-mile-long unlined main canal that distributes water through a system of laterals. There are also four automatic relift pumping stations that provide water to approximately 1,200 isolated tracts of higher-elevation farmland.

Unit B is irrigated by 177 deep wells drawing water from the regional Snake River Plain Aquifer. The wells are 12 to 34 inches in diameter, with an average pumping head of about 2,000 and an average well discharge of about 6.5 cfs. About half of the wells provide water directly to individual farm units, while the others supply water for two or three farm units through main laterals and sublaterals.

Diversions from the Snake River to Unit A average about 55,000 acre-feet annually. ABID has water rights for the diversion of natural flows and contractual rights for stored water in Reclamation's Palisades and American Falls Reservoirs. Annual groundwater pumping in Unit B is estimated at 200,000 acre-feet.

Lack of natural surface drainage outlets to the Snake River and drainage constraints associated with the lower lying MID, require disposal of most irrigation return flows and stormwater from Unit B through drainwells that pass water directly into the underlying eastern Snake River Plain Aquifer. The number of drainwells originally constructed within lands served by the ABID totaled 79, of which 52 remain active. Table 1-1 provides a summary of the location and present status of each of the original 79 drainwells.

TABLE 1-1

LOCATION AND PRESENT STATUS OF DRAINWELLS ASSOCIATED WITH THE A&B IRRIGATION DISTRICT

Drain	*No. of Drainwells*	*Flow-Through Basins*			*Closed Basins*		
		Active	*Inactive*	*Closed*	*Active*	*Inactive*	*Closed*
C	6	2	1	--	1	2	--
D	9	7	--	--	--	--	2
E	5	--	--	--	--	2	3
F	7	4	--	2	1	--	--
G	42	--	--	--	33	6	3
H	2	1	1	--	--	--	--
J	1	--	1	--	--	--	--
K	1	--	1	--	--	--	--
N	2	--	--	--	--	--	2
P	1	--	--	--	1	--	--
T	1	--	--	--	1	--	--
Q	2	--	--	--	1	--	1
Totals	**79**	**14**	**4**	**2**	**38**	**10**	**11**

Source: U.S. Bureau of Reclamation

Drainwells within the ABID are situated within two types of drainage basins:

Closed Basins. There are 59 drainwells (38 of which are active) located within closed basins that do not have a surface outlet from the project area. These wells dispose of drainwater from an estimated 12,000 acres or about 15 percent of the total lands served by ABID.

Flow-Through Basins. Twenty drainwells (14 of which are active) are located within or at the terminus of flow-through basins that have some conveyance outlet extending from project lands. Many of these outlets drain onto lands of the MID. These wells dispose of drainwater from an estimated 110,000 acres.

Drainwells within the NSPD are approximately 8 to 24 inches in diameter with an average depth of 200 feet. Capacities of the drainwells average about 3 cfs; collectively, the original 79 project drainwells were estimated to have a maximum capacity of about 240 cfs. Based on the average 3 cfs capacity, the 52 remaining drainwells are estimated to have a maximum discharge capacity of about 156 cfs, with peak drainwater flow typically occurring in July.

Initially, the primary purpose of drainwells was to provide a means to dispose of return flows resulting from the irrigation of project lands within Unit B. Currently, project drainwells help to dissipate small to moderate levels of storm runoff as well as irrigation returns. This includes runoff associated with winter rain on frozen ground. Moderately high flood flows that exceed the system capacity are contained in catchment sump areas on the ABID and MID, while extreme flows tend to follow historic paths to the Snake River.

Flood studies conducted in 1992 estimated peak runoff from the 100-year flood in the area at about 1,200 cfs, with a 3-day volume of 3,900 acre-feet (Reclamation 1993a). Active drainwells alone could not significantly reduce this instantaneous peak flood discharge, although they would provide some relief by reducing the length of time the low-lying basins are inundated. However, continued use of the drainwells for disposal of storm runoff is not acceptable because flood flows are potentially of poorer quality than irrigation returns (Reclamation 1993a).

2. Water Quality

Reclamation and ABID have regularly monitored the quality of irrigation return flows entering selected NSPD drainwells since 1981; sampling sites and water quality parameters have adjusted periodically to address specific concerns and state standards. Primary emphasis of monitoring has been on turbidity, fecal coliform bacteria, and total organic carbon and nitrates; limited trace element data have also been collected (Reclamation 1993a). Drainwater monitoring indicated that return flows entering project drainwells commonly exceed Safe Drinking Water Act maximum contaminant levels for coliform bacteria and turbidity. No significant concentrations of nitrates or trace elements have been found to date.

D. Other Related Activities

The following is a brief description of related projects which may affect resources within the NSPD.

1. Wetland Demonstration Project. A demonstration project to evaluate use of wetland systems for irrigation drainwater management was initiated at the terminus of the NSPD's H Main Drain under Reclamation's Wetland Program in 1992. Objectives of the project include: (1) evaluation of wetland design features; (2) identification of the hazards and risks associated with constructed wetlands; and (3) feasibility of drainwater treatment prior to injection.

   Results of previous studies indicate that agricultural reuse of drainwater and construction of wetlands for seepage, evaporation, and wildlife habitat may be viable alternatives for disposal of irrigation returns (Reclamation 1993a). However, potential for accumulation of toxic drainwater constituents raises some concerns regarding the long-term feasibility of the wetlands options. Based on initial investigations of contaminants in water, sediment, and biota of existing ponds on the NSPD, the U.S. Fish and Wildlife Service (FWS) concluded that implementation of demonstration seepage and evaporation ponds, in conjunction with wetland habitat development, is warranted.

Results of the current H Main Drain wetland demonstration project are anticipated in 1996. The findings at the H Drain site and other constructed wetlands in the Minidoka Project area will be used as the basis for decisions regarding full-scale use of wetland systems for drainwater management in Unit B, as well as a decision on the preferred alternative.

2. Rupert City Waste Water Application Project. Waste water lagoons are located in a rural area of the ABID. Municipal wastewater is reused for agricultural purposes on Federal lands leased to the City of Rupert.

3. Sprinkler Irrigation. Agricultural lands in the NSPD are increasingly being converted from flood to sprinkler irrigation. Sprinkler conversion on lands located upgradient of ABID, which are currently flood irrigated with surface water, could potentially lower the groundwater table by reducing seepage.

E. Purpose of Environmental Report

The purpose of this Environmental Report (ER) is to evaluate the impacts of the alternatives proposed in the North Side Drainwater Management Framework Plan. The ER focuses on significant environmental issues; however, because the ER must be prepared considerably in advance of any specific design and construction activities, the level of detail and analysis is necessarily broad. When specific actions are proposed at a later stage, more detailed environmental evaluation would be conducted.

II. ALTERNATIVES

Reclamation considered several alternatives to resolve the drainwater issues within the NSPD. These alternatives were developed subsequent to numerous studies including an Idaho Department of Water Resources report, "An Analysis of Feasible Alternatives to Current Irrigation Disposal Well Practices" (May 1983), and Reclamation's study on the use of rapid sand filters, conducted in 1985. This information was utilized in the preparation of the NSPD Drainwater Management Study Preliminary Scoping Report which considers the scope and potential for various alternatives (Reclamation 1990). The proposed North Side Drainwater Management Framework Plan examines three alternatives including the No-Action alternative in which disposal of drainwater through existing injection wells would continue.

Other drainwater management practices which were considered but dismissed prior to further evaluation include filtration with continued injection and improved on-farm water management practices to reduce pollutant levels (with continued injection). These alternatives were not analyzed further for the following reasons: (1) the high costs associated with filtration make this approach appear feasible; (2) improved on-farm management requires voluntary participation by multiple land owners within drainwell watersheds, which cannot be assured by Reclamation; (3) the continuing need for means to accommodate irrigation district disposal of reduced volumes of drainwater and floodwater from lands with improved management; and (4) the continued potential for injection of hazardous materials accidently spilled in the project drainage system.

A total of three alternatives were carried forward for detailed analysis: (1) integrated wetlands and irrigation reuse; (2) irrigation reuse; and (3) no action. Although information is still being gathered at the H Main Drain wetlands demonstration project, Reclamation selected Alternative A as the preferred alternative. This alternative, integrated wetlands and irrigation reuse, is desirable for a variety of reasons. The development of wetlands is consistent with Reclamation's overall environmental objectives, including the wetlands initiative and the FWS's North American Waterfowl Plan (personal communication, Adair 1993). Wetlands have been identified as natural treatment and recharge systems. Reuse without wetlands would not address wetland treatment and use of return flows for groundwater recharge. However, wetland development alone might prove impractical due to high costs and management considerations. The combination of wetlands and reuse provides more flexibility in the management of irrigation return flows.

Phased Implementation

In addition to discussing these alternatives, the Drainwater Management Framework Plan proposes a phased implementation program (Reclamation 1993a). The plan identifies three phases for detailed site-specific planning and implementation of drainwater management measures. This phased approach is designed to assure progress in addressing potential degradation of the underlying aquifer, while awaiting the results of the H Drain demonstration project. That project will reveal the findings regarding the accumulation of toxic contaminants in wetland systems. This approach recognizes the need for flexibility in scheduling to correspond with Reclamation and irrigation district construction priorities, as well as the need for responsiveness to state enforcement of UIC standards.

Phase 1 drainwater management activities will be completed in 1993. Phase 1 activities include: (1) abandonment of a group of 10 inactive drainwells (already completed); (2) initial evaluation of demonstration projects; (3) completion of the Drainwater Management Framework Plan and a programmatic environmental assessment; and (4) development of a budget strategy for implementation.

Phase 2 activities are to be completed in fiscal years 1994-96. Specific tasks include: (1) abandonment of an additional group of nine inactive drainwells; (2) completion of the wetland demonstration project that evaluates wetland use for treatment and disposal of drainwater; (3) securing a FWS decision on toxic accumulation risk in wetlands; (4) evaluation of on-farm reuse projects at nine closed basin sites with implementation where appropriate; (5) design of C and D Main Drain diversion and pump facilities to facilitate irrigation reuse or development of a wetlands complex on adjacent Federal lands; and (6) purchase of right-of-way for a D Main Drain diversion channel.

Phase 3 activities would be scoped after the wetlands demonstration project has been evaluated and a FWS assessment of toxic contaminant accumulation risk has been completed. Phase 3 actions may integrate irrigation reuse and wetlands or consist solely of irrigation reuse measures, depending on the outcome of the wetlands demonstration project.

This document constitutes the programmatic environmental assessment of the Framework Management Plan provided for in Phase 1. The specific alternatives considered in the Drainwater Management Plan may be described as follows:

Alternative A - Integrated Wetlands and Reuse (Preferred Alternative)

Under the preferred alternative, two drainwater management measures would be applied-wetlands development and irrigation reuse. Based on preliminary investigations, up to 700 acres would be developed as wetland areas (Reclamation 1993a). These would likely involve several sites and consist of varying sizes. Where appropriate, irrigation reuse techniques would be integrated with the wetlands development sites. However, irrigation reuse measures under this alternative would not result in the irrigation of any new land within the NSPD (personal communication, Zimmer 1993).

Under the preferred alternative, nine inactive drainwells would be permanently abandoned to meet Idaho State standards, or capped for possible future use as production wells. Management of drainwater currently disposed of in drainwells would be accomplished by integrating constructed wetlands (for seepage and evaporation of drainwater) with irrigation reuse, as described below. Both permanent and temporary wetlands would be created using irrigation return flows. Management of created wetlands would be coordinated with Idaho Department Fish and Game (IDFG). With an average evaporation rate of 3 acre-feet per year, wetland disposal of irrigation return flows could reduce groundwater recharge associated with current drainwell use by up to 2,100 acre-feet per year or about 10 percent. Wetlands for treatment of irrigation return flows, in combination with continued injection, would be applied where appropriate, if the demonstration H Drain wetland project determines that wetlands improve water quality that consistently meets state standards.

Fourteen active drainwells, located along flow-through drains, would be integrated with wetland treatment systems or abandoned. Irrigation return flows and storm water runoff would be collected and disposed of in a series of wetlands located on Federal lands near the termini of C, D, E, F, and H Main Drains. Where reliable supplies of drainwater and costs permit, additional, supplemental water supplies will be provided through an irrigation reuse system for lands currently irrigated from groundwater and Snake River pumping. Irrigation reuse would be accomplished by utilizing farmer-operated pumps installed in drainage sumps or district operated and maintained pumpback and reuse systems that return drainwater to the project distribution system. Where appropriate and feasible, drainwater collection sytems utilizing regulation pumps, gravity pipelines, and reregulation ponds would be constructed to provide useable water supplies. Some drainwells could be equipped with flow/no-flow valves for flood-flow disposal following a period of ponding to improve water quality. Improved on-farm water management practices, including reuse of return flows and conversion to sprinklers would be encouraged as a means of reducing the volume of irrigation return flows.

Irrigation reuse may also be incorporated, if necessary, to provide for flushing of constructed wetlands to prevent accumulation of toxic contaminants or sediments. Where irrigation reuse is used in conjunction with wetland development, Reclamation will assure that water levels are retained so that key wetland areas will be maintained for the benefit of waterfowl and other wildlife.

The 38 active drainwells in closed basins would be closed, or water would be treated in wetland systems prior to injection. Irrigation return flows would be disposed of through a combination of wetland seepage, evaporation or treatment and irrigation reuse. Wetlands for seepage, evaporation, and wildlife habitat would be primary considerations in the closed basin area. In most instances, land acquisition will be necessary to accommodate wetland development in closed-basin areas. Purchase of flood easements, rather than fee title right-of-way acquisition, would be evaluated in site-specific planning to encourage irrigation reuse and minimize land lost to agricultural production.

Where costs are justified, pumpback/reuse systems would be installed to permit reuse of return flows to supplement groundwater pumping for currently irrigated lands. Wetlands disposal of irrigation returns could reduce groundwater recharge associated with drainwell use by up to 2,100 acre-feet per year, or about 10 percent (Reclamation 1993a). Ten potential on-farm pumpback systems will be appraised as part of Phase 2 activities to evaluate the feasibility of irrigation reuse.

Wetland Design Concepts

Three wetland design concepts developed for the Drainwater Management Plan include: (1) embankment retention ponds; (2) excavated retention ponds, and (3) riparian or off-channel wetlands. These wetland concepts, designed for small watersheds within the NSPD and in accordance with Federal Emergency Management Agency criteria, are for embankments under 6 feet regardless of capacity or for impoundments less than 15 acre-feet volume, regardless of embankment height. Final wetland design will require site-specific information and consultation with state and federal agencies and other appropriate groups or individuals, should a decision be made to proceed with this alternative.

The wetland design concepts are designed to operate as natural systems and provide specific functions. Objectives include:

- o Allowing flexibility to adapt the design concepts to different site conditions.
- o Producing a higher wildlife resource value along with other functional goals.

- o Reducing overall long-term maintenance by utilizing natural processes as possible.

Selected functions provided by these wetland design concepts include improving water quality; increasing terrestrial, aquatic, and wildlife diversity and abundance; altering floodflow; and recharging groundwater. Additional functions and values of each wetland design would depend, in part, on the specific watershed and water regime.

Embankment Retention Ponds

Figure 2-1 illustrates a main drain wetland created by impounding water behind an earth fill maintain. It is designed for small watersheds but can accommodate large floodflows. Attributes of this wetland design concept are as follows:

- o Uniform depth inlet and outlet benches for establishment of emergent vegetation.

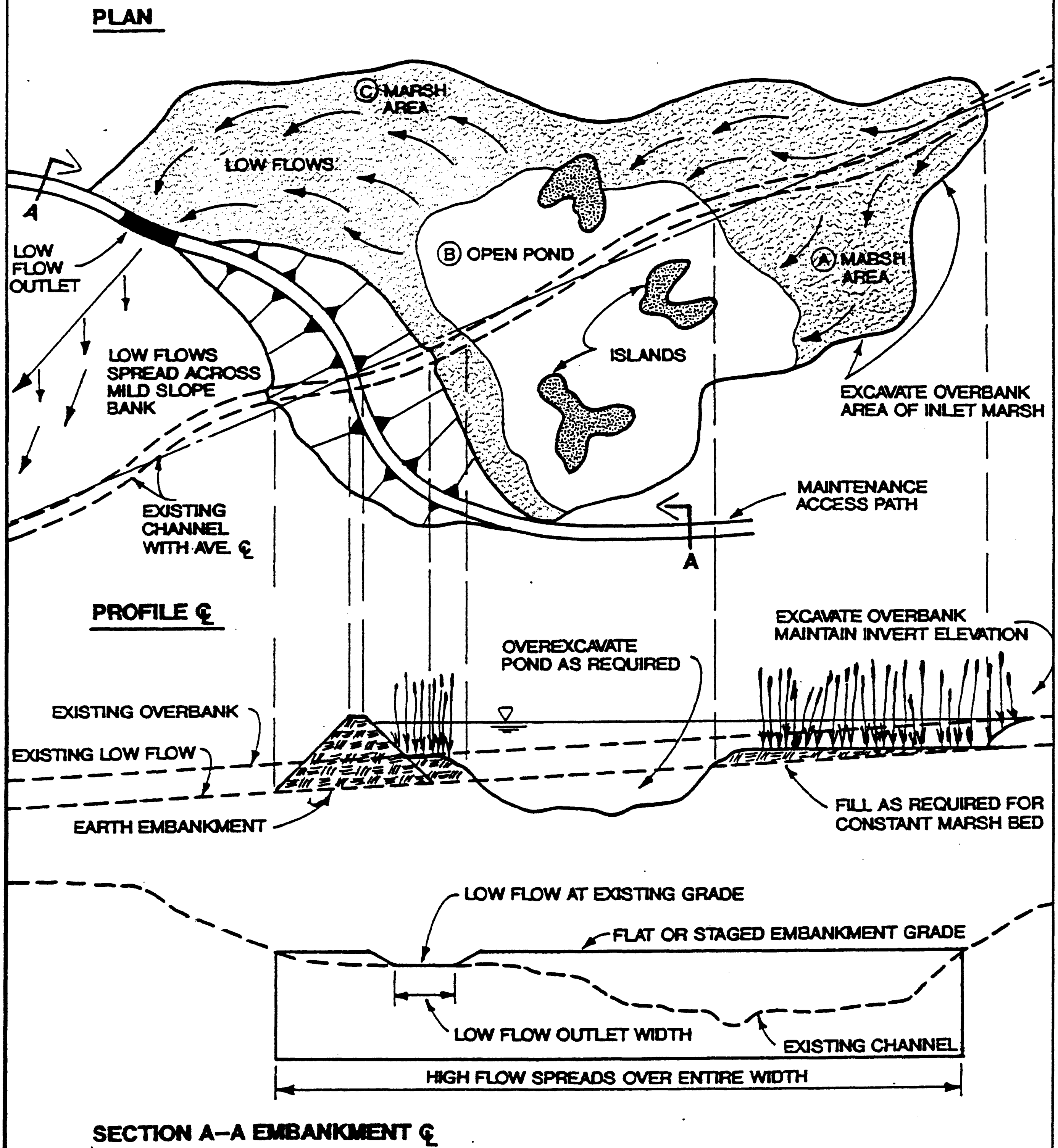
- o A low-flow outlet to the side of the main channel. Low-flow areas would be established at a uniform depth equal to the inlet and outlet bench. Low flows would be constructed to slow the velocity and provide sheet flow on the outlet slope bank. High flows would flow equally over the entire embankment.

- o An open pond area between the inlet and outlet benches with islands provide habitat and even flow distribution.

Excavated Retention Ponds

Figure 2-2 illustrates a second type of main drain wetland. Created by excavating the existing channel and adjacent overbank, areas within this wetland include:

- o An open water area for reducing flow velocity and promoting sedimentation. The open water may be referred to as a sedimentation pond.



Source: USBR 1993

NOT TO SCALE

Figure 2-1

SMALL CHANNEL WETLANDS
EARTH EMBANKMENT POND WETLANDS
SPECIFIC FLOW ROUTING DESIGN

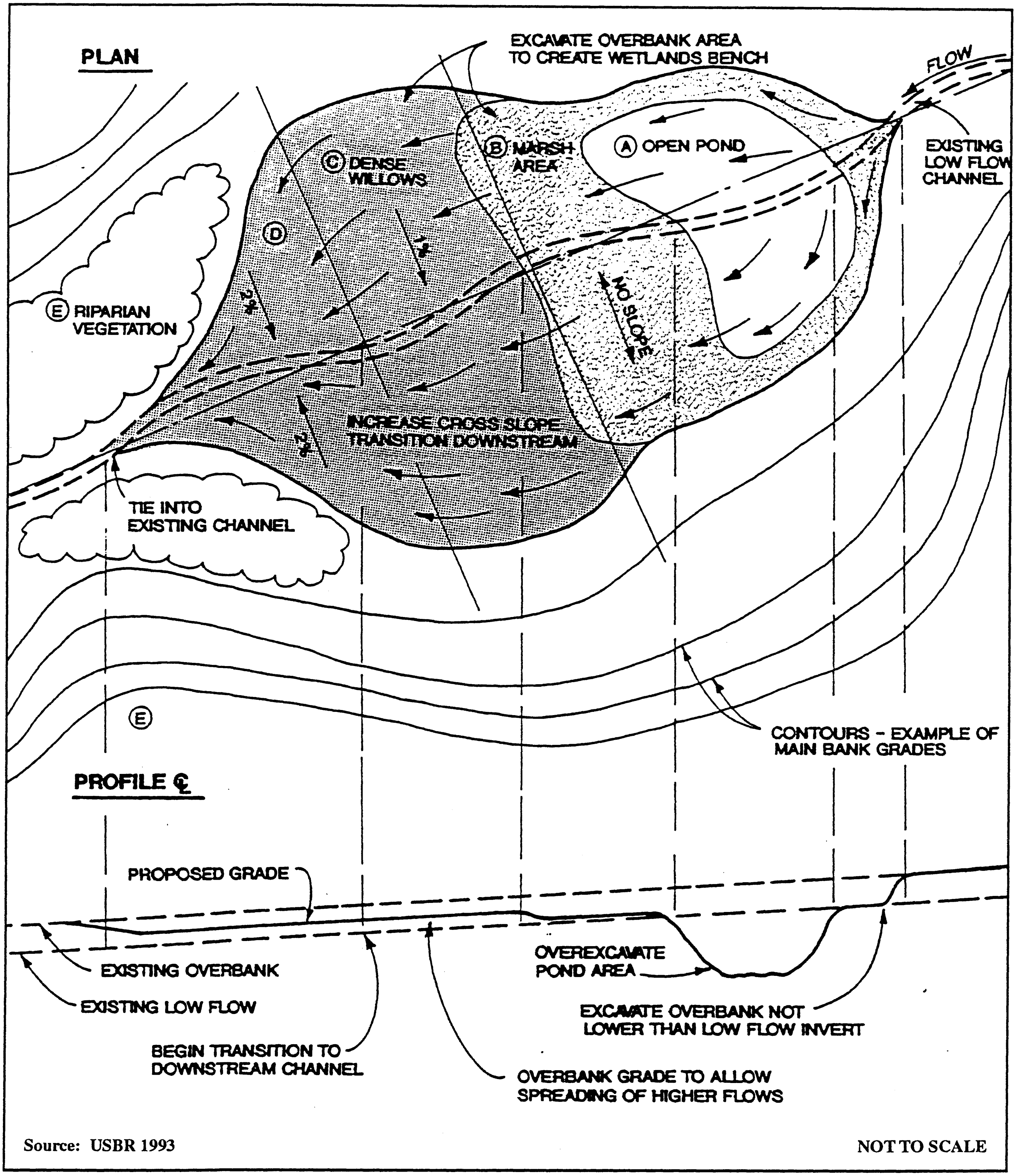


Figure 2-2

SMALL CHANNEL WETLANDS
SEDIMENTATION POND AND WETLANDS TRANSITION
REDUCED FLOW VELOCITY DESIGN

- Down gradient of the sedimentation pond is a relatively flat grade zone for establishment of emergent marsh vegetation. This area would be excavated in the overbank area.

- Down gradient of the emergent marsh zone is a slightly higher shrub zone to reduce high velocity flows.

Riparian or Off-Channel Wetlands

Figure 2-3 illustrates two types of riparian wetlands designed for creation of the main channel. Type A is designed for small streams with a relatively flat overbank cross slope, while type B is designed for larger streams exhibiting a broad floodplain. Both can be designed to alter floodflows and create temporary wetlands.

<u>Alternative B - Irrigation Reuse</u>

Under this alternative, irrigation return flows would be reused on both currently irrigated and non-irrigated lands, as a drainwater management measure. The irrigation reuse system would function as described under Alternative A. However, in addition to the applications of irrigation reuse techniques on currently irrigated lands, this alternative would affect as much as 1,000 acres of undeveloped Reclamation lands within the NSPD. This alternative could become the preferred plan for Phase 3 activities if the demonstration wetlands project finds a significant risk of toxic contaminants accumulation (Reclamation 1993a).

As under Alternative A, this alternative would include the abandonment of the same nine inactive drainwells. Fourteen active drainwells located in the flow-through basins would be closed and the drainwater would be reused to supplement sources of irrigation supplies consisting of groundwater and Snake River pumping. Irrigation of a maximum additional 1,000 acres of Reclamation lands lying in close proximity to the main drains would also be evaluated. New irrigation could increase consumptive use of groundwater on the project by up to 2,200 acre-feet per year (based on consumptive use 2.15 acre-feet per acre per year).

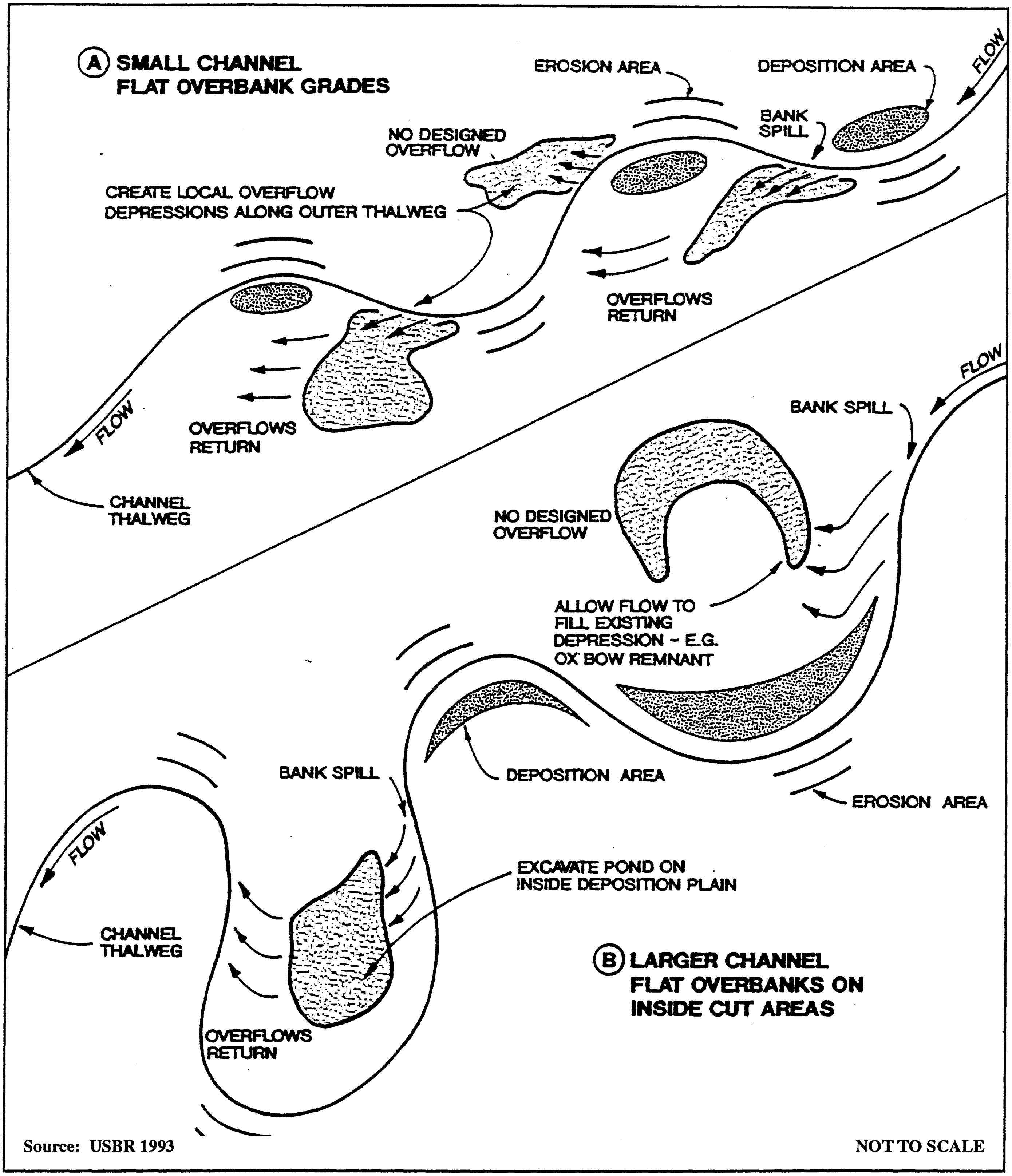


Figure 2-3

SMALL CHANNEL WETLANDS
CREATED OFF-CHANNEL RIPARIAN WETLANDS
ALTERNATE DESIGN CONFIGURATIONS

Drainwater flows on the main drains fluctuate widely on a daily and seasonal basis. Therefore, to implement a substantial irrigation reuse system, a facility to store irrigation water and assure constant flows would be necessary. These storage and reregulation sites have been identified on the F and H Main Drains, on lands that are presently managed by the IDFG for wildlife habitat. Further expansion of storage and reregulation opportunities, in conjunction with maintenance of wildlife habitat at these sites, would be required. A potential storage site on H Drain is currently being used for the wetlands demonstration project. Of the projected 1,000 acres affected by this alternative, a 640 acre tract of undeveloped Reclamation land located between the terminus of the C and D Main Drains would be a possible site for an additional storage reregulation facility for C and D Main Drain flows. Capacity of the C and D Main Drain Storage and reregulation facility has not been established.

The 38 active drainwells in closed basins would be abandoned or capped for possible future use as production wells. As under Alternative A, 10 potential farmer-owned and operated pumpback systems will be appraised as a Phase 2 drainwater management measure. Improved on-farm water management practices, including reuse of return flows and conversion to sprinklers would be encouraged as a means of reducing the volume of irrigation return flows.

Alternative C - No Action

Under the No-Action alternative, use of project drainwells for disposal of an estimated peak 156 cfs of irrigation returns and sporadic storm runoff would continue, as described earlier in Section I.C of this document. The State of Idaho has, however, already ordered the closure of some individual drainwells where operations were shown to result in bacteriological or chemical contamination of domestic water supplies.

III. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter identifies and describes the physical, biological, and socioeconomic environment of the area affected by the alternatives. It also evaluates the nature and magnitude of the impacts on the environment potentially resulting from the alternatives. This description emphasizes those aspects of the environment that may be significantly affected by the alternatives. As such, the analysis excluded those components of the environment not expected to be measurably affected by any of the alternatives. These components include climate, topography, geology, minerals, and air quality.

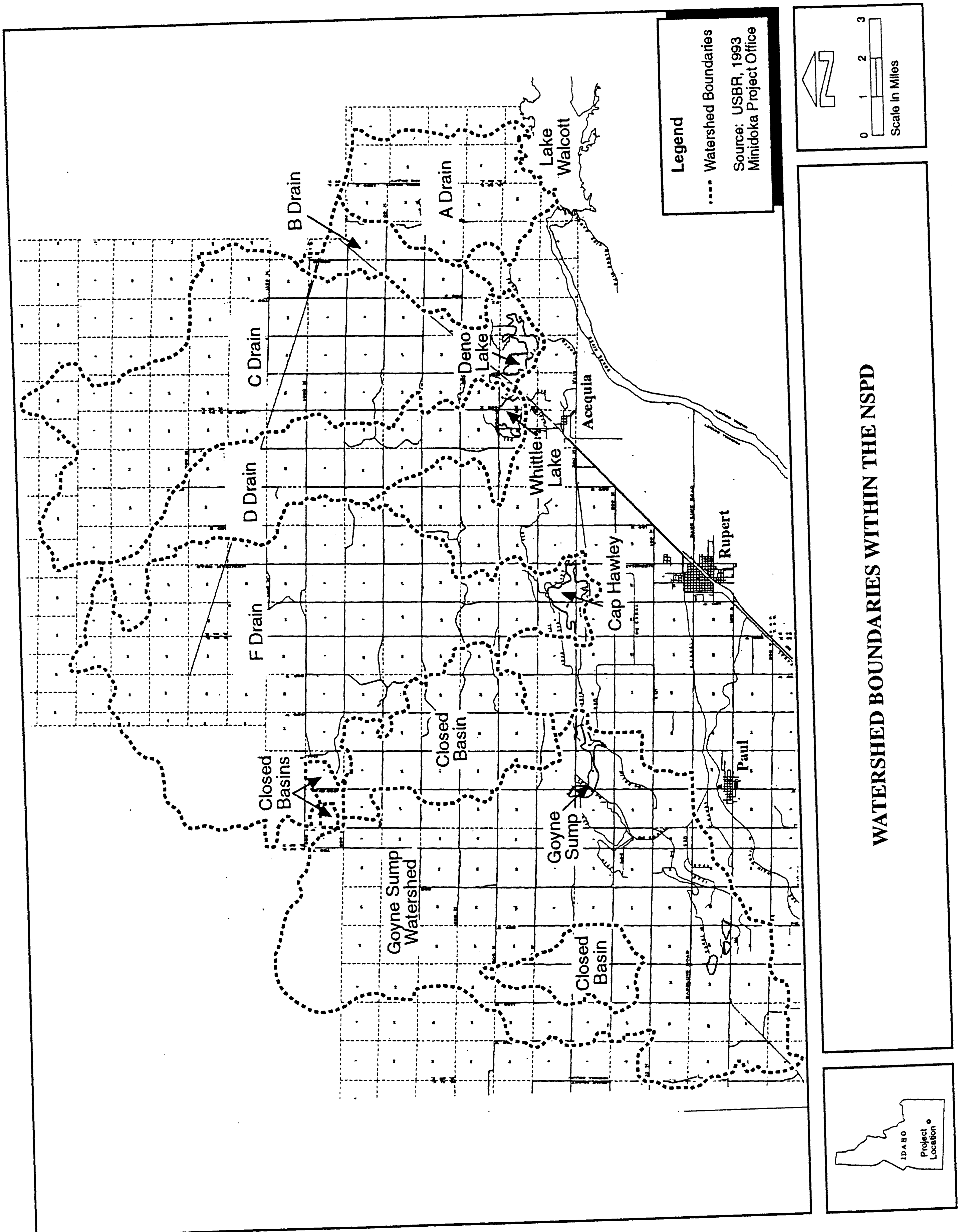
The level of analysis of each component examined herein reflects the potential amount of environmental impact to the component. Furthermore, because the report must be prepared considerably in advance of any specific design and construction activities, the level of detail and analysis is necessarily broad. In those instances where an alternative would result in impacts to a component similar to those identified in a previously described alternative, the similarity is noted and any differences receive emphasis. This chapter also provides proposed measures to mitigate potential adverse impacts.

A. Surface and Groundwater

1. Affected Environment

Surface Water

The ABID's water distribution system includes two main parts. Unit A (14,637 acres) uses about 55,000 acre-feet per year of water pumped from the Snake River and Unit B (62,150 acres) uses about 200,000 acre-feet per year pumped from 177 deep production wells. Watersheds corresponding with Drains A, B, C, D, F, and H (144,365 acres) (see Figure 3-1) are termed flow-through systems (all drains feed into one main drain). The closed basins



WATERSHED BOUNDARIES WITHIN THE NSPD

Figure 3-1

(discontinuous drains) are found in Units E and G (a total of 300-400 acres). All irrigation water in the NSPD is pumped from either the Snake River or the groundwater using 198 pumps for lifting and relifting water. The 177 production wells are 12 to 34 inches in diameter and have an average depth of 326 feet. Pump capacities range from 1.7 to 12.0 cfs with a total pump capacity of 1,079 cfs. The quantity of water in the main drains fluctuates widely on a daily and seasonal basis, but peaks in July.

Currently, drainwells are used to inject irrigation return flows back into the Eastern Snake River Plain Aquifer. There are a total of 79 drainwells available (refer to Figure 1-2), 52 of which are active. Drainwells, 8 to 24 inches in diameter, are cased down to the basalt at about 20 feet where they remain uncased (open hole) down to about 200 feet. Uncased boreholes may allow groundwater to mingle freely between producing zones. The average capacity of each drainwell is 3 cfs for a total capacity of 156 cfs; for these drainwells, peak flow occurs in July. Occasionally, drainwells become plugged and either dynamite is used, or a driller is hired to clean them out (personal communication, Temple 1993). The current system of handling return flows at the ABID cannot account for quantities of water produced naturally during flood events.

Injection well permits are required by the Idaho Department of Water Resources (IDWR) for the continued use of all drainwells. Drainwells have been prioritized by Reclamation based on the ease of closure: "1" being the easiest and "10" being the most difficult to cap or abandon. Draft permits for priority 1 and 2 drainwells were released for public comment on September 6 1993, and permitting processes for the remaining drainwells are in progress (personal communication, Thorton 1993).

The typical irrigation year for the ABID begins April 15th and runs through October 15th. Operator (user) allotments are 3 acre-feet of water per acre of land at $35.00 per acre. If the water allotment exceeds that amount, additional water can be purchased from the ABID. The average volume of water used per acre within the ABID was 3.46 acre-feet per acre in 1992, up from 3.04 acre-feet per acre, the average since 1962. When a farmer requests water from the distribution system, the pump servicing that farmer is turned on and runs constantly for 24-

hours. Since there are no variable speed pumps at the ABID, the excess water is dumped into the drains and qualifies as operational waste. Currently, 55 percent of the farmers in the ABID operate sprinkler irrigation systems, which has reduced the volume of return flows to less than 50 percent of their pre-sprinkler levels under furrow irrigation (gravity flow systems) (personal communication, Temple 1993).

The conversion of gravity irrigated land to sprinklers has had a major impact on the amount of irrigation return flow leaving the lower end of the fields. There are some estimates of no return flow from a sprinkler irrigated field; however, since some minimum flow is observed in the drains, it may be accounted for as return flow and operational waste water.

Computations used in 1974 drainage investigations by Reclamation indicate a peak return flow in the month of July as .0029 cfs per irrigated acre. The design supply delivery for each irrigated acre is .015 cfs. Therefore, the expected return flow percentage is 19.3 percent.

The summary of water delivery by the ABID shows the total pumped in 1992 as 219,256.7 acre-feet of water. Of that amount, 1,070 acre-feet are recorded as waste and 10,462.6 are recorded as loss. If all of the waste and loss is returned down the drains, it would amount to 5.3 percent of the pumped water (Reclamation 1993). For the purpose of estimation, this could be considered as the lower limit of the current operating system if all of the land were under sprinkler irrigation and each farm implemented some form of capture and reuse system.

The expected range of return flows for the area are then:

- o Minimum Return Flow = 5.3 percent of pumped water supply annually
- o Maximum Return Flow = 19.3 percent of pumped water supply annually

As calculated by Reclamation, the expected ABID average of return flow equals 15 percent including sprinklers and gravity irrigated land and operational return flow (Reclamation 1993).

Groundwater

Irrigation return flows injected in the drainwells enter the Eastern Snake River Plain Aquifer. Groundwater withdrawn from wells and springs supplies 100 percent of the drinking water consumed within the Snake River Plain (EPA 1991). The 10,800-square-mile aquifer is a structural downwarp filled with volcanic rocks extruded during the Tertiary and Quaternary ages. Numerous layers of flood-type basalt were extruded from linear vents with some interbedded sediments.

Horizontal movement of water in basalt is primarily through rubbly tops of volcanic flow sequences where hydraulic conductivities (the volume of water that will move through a medium in a unit of time under a unit hydraulic gradient through a unit area) are high (Lindholm et al. 1987). On a regional scale, groundwater moves westwardly with an average gradient of 12 feet per mile. Near the margins of the aquifer, groundwater flow direction is altered due to underflow from drainage basins and along gaining reaches (where groundwater recharges surface water) of the Snake River. Aquifer flow velocities average 9.8 feet per day (Wood and Low 1988).

The depth-to-water below the land surface is 100 to 300 feet in the vicinity of the ABID (Lindholm et al. 1987). Groundwater flow direction in the ABID is westwardly and the groundwater gradient slows to about 2.54 feet/mile (Mundorff et al. 1964). Runoff and underflow into ABID Drains A through H are influenced by 200,000 acres of private farm land to the north.

Highly fractured basalts underlying the Snake River Plain may provide conduits, impedances, or blockages for vertical movement of groundwater and can alter the horizontal movement of groundwater. In general, though, the high permeability of the soil mantle and porosity of underlying rock provide excellent internal drainage (Reclamation 1993). Aquifer recharge occurs from percolation of surface water used for irrigation (60 percent), underflow from tributary drainage basins (25 percent), direct precipitation upon the Eastern Snake River Plain

(10 percent), and losses from the Snake River (5 percent) (Lindholm et al. 1987). Groundwater discharge occurs as springs and seeps into surface water (66 percent) or as withdrawal from production wells (33 percent).

A portion of the irrigation water from the ABID drains south to the MID. Underlying the MID, Quaternary age sediments form a perched aquifer such that unsaturated earth materials occur between the base of the perched aquifer and the regional aquifer (Lindholm et al. 1987). Due to the addition of irrigation water to this perched aquifer (with an 8 to 9 foot depth-to-water) and subsequent discharge to the Snake River, the river is gaining. Vertical groundwater movement to the deeper basalt regional aquifer may occur at extremely slow rates in perched aquifer areas.

2. Environmental Consequences

Alternative A - Integrated Wetlands and Reuse (Preferred Alternative)

Surface Water

Newly constructed wetlands, covering a maximum area of 700 acres, would increase the quantity of surface water at the ABID. Wetlands development would alter the distribution of surface water, but should not result in any adverse water quantity affects. Indeed, the integrated wetlands and reuse system will provide another option for handling irrigation return flows and storm water runoff.

Groundwater

In the Eastern Snake River Plain Aquifer, groundwater withdrawals for irrigation were identified as the probable cause of declining water levels (Lindholm et al. 1987). The aquifer has declined 18 to 20 feet from 1955-56 to the present, according to ABID records (personal communication, Temple 1993). Since the inception of sprinkler use, which is more water efficient than furrow irrigation, return flows and, thus, groundwater levels have declined. These levels are expected to continue to decline even more in the future due to this expected reduced amount of recharge (personal communication, Temple 1993). This alternative calls for some reuse of irrigation returns, therefore the volume of water pumped from the Eastern Snake River Plain Aquifer may be reduced slightly.

Given a maximum wetland area of 700 acres and an evaporation rate of 3 feet/year (does not account for seepage or transpiration), wetland disposal of irrigation returns could reduce groundwater recharge associated with current drainwell use by up to 2,100 acre-feet/year or about 10 percent (Reclamation 1993). However, this alternative should have a beneficial effect on water quality through plant uptake and contaminant filtering (refer to Section B). Therefore, where wetland treatment with continued injection could be applied, groundwater recharge would likely be increased.

<u>Alternative B - Irrigation Reuse</u>

Surface Water

Drainwater collection systems utilizing valved drainwells, project pumps, gravity pipelines, and ponds would need to be constructed to handle return flow water for later reuse. Newly constructed settling ponds would increase the quantity of surface water at the ABID. Irrigation reuse is not anticipated to substantially affect the method of handling irrigation return flows or storm water runoff.

Groundwater

In the Eastern Snake River Plain Aquifer, groundwater withdrawals for irrigation were identified as the probable cause of declining water levels (Lindholm et al. 1987). The aquifer has declined 18 to 20 feet from 1955-56 to the present according to ABID records (personal communication, Temple 1993). Since this alternative calls for the reuse of irrigation returns on approximately 1,000 acres of currently non-irrigated land, consumptive use of groundwater could increase by up to 2,200 acre-feet per year, based on consumptive use of 2.15 feet per year (Reclamation 1993a). Groundwater levels would decline under this alternative due to the reduction in water available for aquifer recharge. Furthermore, as stated under Alternative A, due to sprinkler use, groundwater levels have declined and are expected to continue to decline even more in the future.

Alternative C - No Action

Surface Water

Flood events may cause water quantities that cannot be handled by the current ABID drain system. As is currently the case, roads located along drainages for easy system maintenance could also be damaged by flooding.

Groundwater

The Eastern Snake River Plain Aquifer will likely continue to decline under the current aquifer-wide conditions of withdrawal exceeding recharge. The groundwater level decline, discussed above, which is attributed to sprinkler use, will likely continue.

3. Mitigations

Alternative A - Integrated Wetlands and Reuse (Preferred Alternative)

In the closed-basin areas, where wetland construction is not feasible, recharge to the Eastern Snake River Plain Aquifer through monitored injection wells could be used to mitigate declining aquifer water levels. Where elevated contaminant levels are detected, vegetative strips for filtering out contaminants could be used. A valved drainwell could be closed to contain return flows until contamination is remediated and then drains could be opened to allow the remediated water to recharge the aquifer. Valved drainwells could be used as an initial step in mitigating agricultural drainage problems associated with storm runoff.

Alternative B - Irrigation Reuse

Under this alternative, the beneficial effects from wetlands development would not be available. Therefore, the amount of water to recharge the aquifer would be considerably less. However, the mitigation measures described for Alternative A for those areas where wetlands would not be developed, could also be applied under Alternative B.

Alternative C - No Action

No need for mitigation was identified for surface and groundwater resources within the affected environment as a result of the No Action alternative.

B. Water Quality

1. Affected Environment

In preliminary investigations of water quality, only aluminum and zinc concentrations in selected wetland and pond waters of the ABID were slightly elevated and were close to exceeding some water quality standards (Mullins and Burch 1991). Cadmium was found at slightly elevated concentrations in sediment samples. Organochloride compounds were not detected in water or sediments in wetlands and ponds (Mullins and Burch 1991). A constructed wetland demonstration project (H Drain) is underway at the ABID and water and sediment quality will be closely monitored.

Based on studies conducted in the region (Seitz et al. 1977), potential contaminants within the NSPD could include suspended sediment and pesticides. Chromate, arsenate, methyl mercury, metal chelates, and organo-metal compounds derived from fertilizers or pesticides can also be potential threats to water quality.

In addition, nutrients essential to plant growth, including nitrates, phosphorus, and organic carbon, are applied as fertilizers and are usually detected in irrigation return flows and wetland areas (Seitz et al. 1977). Nitrate is relatively soluble, moves freely and is commonly found in water. Phosphorus is more readily absorbed and is usually detected only in small quantities in water. Organic carbon is found in the form of particulate matter that is easily filtered out of water but may concentrate in sediments. Algal blooms caused by high nutrient groundwater could cause reducing conditions in wetland areas.

If bacteria are introduced, they have been known to survive and even multiply in water given the proper conditions (Seitz et al. 1977). Typhoid, hepatitis, and dysentery are well-known diseases caused by pathogenic organisms (Seitz et al. 1977).

The ABID uses xylene and acrolein for aquatic vegetation control in ditches (personal communication, Temple 1993). Also 2,4-D® and Rodeo®, effective herbicides for terrestrial weeds, are used by ABID (personal communication, Temple 1993). The pesticide 2,4-D was found in high concentrations in a now abandoned production well in the F Drain of the ABID (Seitz et al. 1977), inferring that it may have been introduced as injected return flow.

Irrigation return flows form ponds and wetlands at terminal drains (the end of flow through systems). Return flows are injected into the Snake River Plain Aquifer in closed basins and where volumes are too great, along terminal drains, ponds, and wetlands. Return flows are monitored for total and fecal coliform bacteria, total organic carbon, nitrates, and turbidity. The Safe Drinking Water Act maximum contaminant levels for coliform bacteria and turbidity have been exceeded within the ABID. Table 3-1 lists water quality ranges and means for drainwater in the Minidoka North Side Pumping Division measured from 1981 to 1992. Measurements for electrical conductivity, total lithium, total manganese, and fecal coliform bacteria exceeded water standards in some instances.

TABLE 3-1

WATER QUALITY CHARACTERISTICS OF DRAINWATER ON THE MINIDOKA NORTH SIDE PUMPING DIVISION (1981-1992)[1]

Parameter	Standards/Criteria			Drainwater Concentrations		
	Drinking Water (EPA)	Aquatic Life[2]	Irrigation Water[3]	No. of Samples	Range	Mean[4]
Electrical Conductivity (μS/cm)			750[5]	1,021	6 - 1,079	638
Turbidity (FTU)				1,127	1 - 1,400	66
Nitrate+Nitrate - N (mg/L)	10			986	0.1 - 10.0	2.0
Arsenic, Total	50	850	100	41	1 - 20	6
Boron			750	43	20 - 580	188
Cadmium, Total	5	3.9	10	77	<1 - <2	1
Chromium, Total	100	16	100	77	<1 - 26	6
Copper, Total	1,000	18	200	77	<1 - 28	6
Iron, Total	3,000[6]		5,000	77	60 - 20, 300	2,930
Lead, Total	15	82	5,000	77	1 - 23	7
Lithium, Total			75	73	25 - 85	44
Manganese, Total	50[6]		200	77	2 - 645	100
Mercury, Total	2	2.4		78	<0.2 - 1.0	0.24
Selenium, Total	50	20	20	37	<1 - 2	2
Zinc, Total	5,000	120	2,000	77	1 - 132	30
Total Coliform Bacteria (counts/100 mL)	<1			888	5 - 34,000	1,843
Fecal Coliform Bacteria (counts/mL)	<1		4,000	888	<2 - 9,000	251

Source: U.S. Bureau of Reclamation
Notes: μS/cm = microsiemens per centimeter FTU = Formazin Turbidity Units mg/L = milligrams per liter mL = milliliters

1. Units are micrograms/liter except where noted
2. Aquatic life criteria used by USFWS in the 1991 Minidoka North Side Contaminants Assessment
3. Adapted from Water Quality Criteria for Agriculture (1972)
4. Mean of samples exceeding detection limits
5. Problems for sensitive crops such as beans
6. Secondary standards

The Eastern Snake River Plain Aquifer is likely too voluminous to become entirely contaminated under any realistic scenario (EPA 1991). The EPA agrees that contamination of the entire aquifer is highly unlikely, but notes that documented instances of local groundwater contamination abound and, given the high cost of cleaning up contaminated groundwater, pollution prevention is becoming a priority for the ABID (EPA 1991).

2. Environmental Consequences

Alternative A - Integrated Wetlands and Reuse (Preferred Alternative)

Wetlands could improve the water quality of return flows due to the mechanisms of plant uptake and contaminant filtering. Wetlands have the demonstrated ability to remove suspended sediments including bacteria and nutrients, particularly nitrogen and phosphorus. Under this alternative, irrigation reuse will be incorporated to provide for flushing of constructed wetlands to prevent accumulation of toxic contaminants, if necessary. Without a flushing mechanism and/or dredging of sediments, terminal wetlands could accumulate toxic levels of some contaminants. The results of the H drain demonstration project will provide valuable information on the potential effects of this alternative.

Alternative B - Irrigation Reuse

Where possible, irrigation reuse may provide a flushing mechanism in settling ponds to prevent the accumulation of toxic contaminants. However, this alternative would not provide for the beneficial effects associated with the mechanisms of plant uptake and contaminant filtering associated with the creation of wetlands.

Alternative C - No Action

As discussed in Section B.1, drainwells may introduce poor quality irrigation return flow water to the Snake River Plain sole-source aquifer (Seitz et al. 1977).

The current use of drainwells bypasses natural filtration, absorption, and ion exchange processes afforded by percolation through the unsaturated zone and potentially allows the introduction of high concentrations of contaminants to the aquifer. However, it should be noted that naturally occurring large openings in the form of fractures and fissures common to basaltic rock do not afford the filtration afforded by more common sand and gravel aquifers.

Since all of the approximately 650 homes in the ABID have domestic wells, there is a potential for contamination of drinking water supplies. The conclusions of the Seitz study (1977) state that increases in sulfate, chloride, and specific conductance, along with high bacteria concentrations found both at drainwells and at appreciable distances in the downgradient direction, indicate that drain-well inflow can have a direct impact on the quality of groundwater that is pumped to domestic production wells. Furthermore, the greatest threat to human health from irrigation drainwells may not be the agricultural wastes routinely discharged into the aquifer, but rather the possibility of introduction of other contaminants either accidentally or during a flood event (Seitz et al. 1977).

3. Mitigation

Alternative A - Integrated Wetlands and Reuse (Preferred Alternative)

The water quality of wetlands should be monitored on a regular basis to avoid the accumulation of toxic contaminants that are not eliminated by plant uptake and filtering. The static water levels, vegetative types, and other factors can be altered based on water quality monitoring results.

In the closed-basin areas, where wetland construction is not feasible, recharge to the Eastern Snake River Plain Aquifer through monitored drainwells could be used to mitigate declining aquifer water levels. Where elevated contaminant levels are detected, vegetative strips for filtering out contaminants could be used. A valved drainwell could be closed to contain return flows until contaminants are filtered or deposited as sediment and then drains could be opened to allow water to recharge the aquifer. Valved drainwells could be used as an initial step in mitigating agricultural drainage problems associated with storm runoff.

Since pesticides and other potential contaminants are relatively insoluble, settling ponds could be dredged occasionally to avoid concentrating contaminants in the sediments. Historically, sediments have been dredged out of the settling ponds and reutilized as topsoil on farmlands in the ABID (personal communication, Temple 1993).

Alternative B - Irrigation Reuse

Under this alternative, the beneficial effects from wetlands development would not be available. Therefore, the associated filtering process would not occur and a measure similar to those closed basins under Alternative A could be implemented.

Alternative C - No Action

The continued use of drainwells at the ABID would require regular monitoring of several water quality parameters and may eventually require actions such as well closure. All parameters that could potentially violate drinking water standards, including bacteria accumulation, could be monitored in the return flows entering the sole-source aquifer. Where elevated contaminant levels are detected, vegetative strips for filtering out contaminants could be used. A closed-drain holding pond could contain return flows until contamination is removed and then drains could be opened to allow the remediated water to recharge the aquifer.

If coliform bacteria are detected in the irrigation return flows, the following mitigation would apply (IDWR 1993). Groundwater produced from points of diversion, adjacent to injection wells that dispose of fluids containing coliform bacteria in concentrations that exceed MCL's for drinking water, will be subject to monitoring by the owner/operator (IDWR 1993). Best management practices (state recommended practices) are recommended to reduce concentrations of coliform bacteria and the use of ozonation (an oxidizing technique), chlorination devices, sand filters, and settling pond specifications may be required to reduce or remove coliform bacteria (IDWR 1993).

Both well-sorted (clean) and poorly sorted (dirty) sands were tested as rapid sand filters for bacteria removal from D Drain return flows at the ABID (personal communication, Zimmer 1993). The filters effectively removed the bacteria, but clogged in a day or two, making the maintenance of such a system impossible (personal communication, Zimmer 1993). In addition, a self-cleaning flushing system for sand filter maintenance was tried and found to be much too expensive (personal communication, Zimmer 1993).

Even if filtration of return flow water to be injected into the Snake River Plain Aquifer was a successful means of addressing the water quality and aquifer recharge problems, storm runoff water produced during floods could still be a problem with continued use of drainwells at the ABID. Most of the contamination found in domestic wells within the ABID occurred subsequent to a significant flood event (personal communication, Temple 1993). Since ABID drainwells were never intended to handle storm runoff, a flood management plan could be useful.

C. Vegetation and Wildlife

1. Affected Environment

The affected environment (study area) for vegetation and wildlife includes all watersheds within Reclamation's Minidoka Project (refer to Figure 3-1). The study area lies within the Snake River Basin/High Desert Ecoregion (Omernik and Gallant 1986). Topography in the affected environment is relatively level to gently rolling hills. Elevations range from 4,000 feet above mean sea level (AMSL) near the Snake River to approximately 5,000 feet AMSL in northern Minidoka County. Climate in Minidoka County is described as semiarid with warm, dry summers and low annual natural precipitation. Description of the affected environment for biological resources is based on a summer 1993 field reconnaissance survey, consultation with natural resource agencies, and review of previous environmental documents for the area.

Vegetation

Vegetation within the affected environment includes native and exotic plant species and communities. For purposes of discussion, vegetation within the affected environment is categorized by cover type.

As determined by the U.S. Soil Conservation Service (SCS), major land resource areas for the affected environment include the Central and Upper Snake River Plains (SCS 1980). Native vegetation within the Snake River Basin/High Desert Ecoregion is characterized as sagebrush steppe (Omernik 1986). Historically, the affected environment was dominated by bluebunch wheat grass (*Agropyron spicatum*), Thrubur needlegrass (*Stipa thurberiana*), sagebrush (*Artemisia* spp.), and forbs such as winterfat (*Eurotia lanata*) (Reclamation, 1986). Existing vegetation cover types include shrub-steppe, grasslands, wetlands, and irrigated farmland. The dominant cover type in the affected environment is irrigated farmland which is interspersed with native shrub-steppe, grasslands, and isolated wetlands. Components of each cover type are discussed below.

The FWS categorized existing cover types within the study area with respect to resource categories and mitigation goals for the proposed Minidoka North Side Pumping Division Extension Project (FWS 1985). The shrub-steppe habitat is designated Resource Category 3. This Resource Category has a "no net loss of habitat value while minimizing loss of in-kind habitat value." The grassland cover type in the affected environment is designated Resource Category 4 and has a mitigation goal of "minimize loss of habitat value." Scrub-shrub and herbaceous wetland cover types are designated Resource Category 2 and have a mitigation goal of "no net loss of in-kind habitat values." The wetland cover type is discussed under section D.

The shrub-steppe cover type is dominated by big sagebrush (*Artemisia tridentata*) but silver sagebrush (*Artemesia cana*) can occur in low areas or playas (FWS 1985). This cover type occurs on idle lands without sufficient irrigation water for farming and on Reclamation withdrawal lands managed by the IDFG for wildlife habitat. Rabbitbrush (*Chrysothamus* spp.)

is a common shrub species within the shrub-steppe cover type. Forbs occurring as understory in this cover type include tumble mustard (*Sisymbruim altissimum*), prickley lettuce (*Lactuca serriola*), lupine (*Lupinus* spp.), prickly-pear cactus (*Opuntia* spp.), common yarrow (*Achillea millefolium*), and goatsbeard (*Tragopogon* spp.) (FWS 1985).

In addition to wildlife habitat, the shrub-steppe cover type is used for livestock grazing. Historical heavy grazing pressure and fires in this cover type have degraded the diversity and quality of native vegetation in some areas.

The grassland cover type within the affected area is dominated by cheatgrass (*Bromus tectorum*) and occurs on rangelands that have been overgrazed or subjected to repeated fires. Areas that are not grazed may also support Sandberg bluegrass (*Poa sandbergii*), bluebunch wheatgrass, squirreltail (*Sitanion hystrix*), and needle-and-thread grass (*Stipa* spp.) (SCS 1975; FWS 1985). Small, isolated pastures also occur within the affected area. These sites are dominated by introduced grasses including brome (*Bromus* spp.) and orchard grass (*Dactylis glomerata*) (personal communication, Neilson 1993).

Plant species comprising the irrigated farmland cover type vary seasonally and annually but primarily include annual crops of potatoes, sugar beets, peas, and grains. Alfalfa (*Medicago sativa*) is grown for hay in the affected environment and represents the dominant perennial crop. The majority of farmland in the area is irrigated cropland. Windbreaks or shelterbelts, also occur within the farmland cover type, typically adjacent to farm houses or other structures. Irrigated cropland comprises the majority of land in Minidoka County. Dry cropland represents a minor component of total affected acreage.

Noxious weeds can occur in any of the vegetation cover types within the affected environment. Noxious weeds documented for Minidoka County include: Canada thistle (*Cirsium arvense*), diffuse knapweed (*Centaurea diffusa*), yellow toad flax (*Linaria vulgaris*), musk thistle (*Carduus nutans*), perennial sowthistle (*Sonchus arvensis*), puncturevine (*Tribulus terrestris*), Russian knapweed (*Centaurea repens*), scotch thistle (*Onopordum acanthium*), spotted knapweed

(*Centaurea maculosa*), white-top (*Cardaria draba*), poison hemlock (*Conium maculatum*), dyers woad (*Isatis tinctoria*), leafy spurge (*Euphorbia esula*), purple loosestrife (*Lythrum salicaria*), and Syrian bean caper (*Zygophylium fabago*) (personal communications, Hopkins 1993; Minidoka County Weed Control Authority 1993).

A summer 1993 field reconnaissance recorded the following vegetation within the affected area: cattail (*Typha* spp.), bulrush (*Scirpus* spp.), cheatgrass, sagebrush, crested wheatgrass (*Agropyron cristatum*), thistle (unknown species), alfalfa, timothy (*Phleum pratense*), brome grass, fescue (*Festuca* spp.), bluegrass (*Poa* spp.), orchard grass, rabbitbrush, prickly lettuce, shepardspurse (*Capsella bursa-pastoris*), black mustard (*Brassica nigra*), kochia (*Kochia scoparia*), fanweed (*Thlaspi arvense*), western salsify (*Tragopogon dubius*), red root pigweed (*Amaranthus palmeri*), lambsquarter (*Chenopodium berlandieri*), blue spruce (*Picea pungens*), scots pine (*Pinus sylvestris*), and poplar (*Populus* spp.),

Wildlife

Wildlife within the affected area includes all terrestrial and aquatic animals not identified later in the document as threatened, endangered, or as species of special concern (refer to Section E). Primary wildlife categories include birds, mammals, reptiles, amphibians, and aquatic life.

Birds inhabiting the affected environment primarily include waterbirds and edge species common to cropland and wetland cover types in the Snake River Basin. Categories of birds identified for the affected environment include upland game birds, raptors (e.g., hawks, owls, eagles, falcons, and vultures), songbirds (e.g., passerines), and waterbirds (e.g., ducks, geese, and shorebirds).

According to FWS waterfowl harvest data, the 10-year average annual duck and goose harvest for Minidoka County from 1981-1990 was 4,376 and 934, respectively (Martin 1992). The Snake River, Lake Walcott, and Milner Lake are a major spring and fall migration and wintering area (Reclamation 1986). Primary waterfowl species at these locations during migration and winter are whistling swan (*Cygnus cygnus*), Canada goose (*Branta canadensis*), snow goose

(*Chen caerulescens*), mallard (*Anas platyrhynchos*), northern pintail (*Anas acuta*), gadwall (*Anas strepera*), American wigeon (*Anas americana*), northern shoveler (*Anas clypeata*), and green-winged teal (*Anas crecca*) (Reclamation 1986). Mallards and blue-winged teal are the most common waterfowl species in the affected area (FWS 1985). Wetlands within the affected area provide low-value waterfowl habitat due to their lack of management and the periodic burning and cleaning of drains and ponds (FWS 1985). Nesting success in affected environment emergent wetlands is considered low due to the dense emergent growth and lack of nearby cover on adjacent uplands (Reclamation 1987).

Ring-necked pheasant (*Phasianus colchicus*) is the most common and popular upland game bird in the affected environment (FWS 1985). This species has declined from its highest densities in the 1960s due to changes in farming practices and loss of habitat (FWS 1985). The current interspersion of cropland and sagebrush still provides habitat for pheasants in the affected environment. Morning doves (*Zenaida macroura*) and gray partridge (*Perdix perdix*) also occur in the affected environment (Reclamation 1986).

Raptors identified for the affected environment that are not classified as species of special concern include American kestrel (*Falco sparverius*), northern harrier (*Circus cyaneus*), barn owl (*Tyto alba*), burrowing owl (*Athene cunicularia*), red-tailed hawk (*Buteo jamaicensis*), rough-legged hawk (*Buteo lagopus*), turkey vulture (*Cathartes aura*), prairie falcon (*Falco mexicanus*), Cooper's hawk (*Accipiter cooperii*), and northern saw-whet owl (*Aegolius acadicus*) (Reclamation 1986).

Birds observed during a summer 1993 field reconnaissance survey of the affected environment include American bittern (*Botaurus lentiginosus*), American avocet (*Recurvirostra americana*), mallard, redhead (*Aythya americana*), blue-winged teal (*Anas discors*), yellow-headed blackbird (*Xanthocephalus xanthocephalus*), red-winged blackbird (*Agelaius phoeniceus*), cinnamon teal (*Anas cyanoptera*), northern harrier, northern shovler (*Anas clypeata*), black-billed magpie (*Pica pica*), common nighthawk (*Chordeiles minor*), killdeer (*Charadrius vociferus*), morning dove, rock dove (*Columba livia*), American kestrel, ring-necked pheasant, barn swallow (*Hirundo* *rustica*), burrowing owl, red-tailed hawk, house sparrow (*Passer domesticus*), American robin (*Turdus migratorius*), western meadowlark (*Sturnella neglecta*), European starling (*Sturnus vulgaris*), spotted sandpiper (*Actitis macularia*), California gull (*Larus californicus*), and American coot (*Fulica americana*).

FWS 1991, 1992, and 1993 Breeding Bird Survey data for the Acequia route (Route 26) documented the following additional bird species not observed during the 1993 field reconnaissance survey: great blue heron (*Ardea herodias*), gray partridge, killdeer (*Charadrius vociferus*), black-necked stilt (*Himantopus mexicanus*), long-billed curlew (*Numenius americanus*), common snipe (*Gallinago gallinago*), ring-billed gull (*Larus delawarensis*), Swainson's hawk (*Buteo swainsoni*), short-eared owl (*Asio flammeus*), western kingbird (*Tyrannus verticalis*), horned lark (*Eremophila alpestris*), common raven (*Corvus corax*), rock wren (*Salpinctes obsoletus*), loggerhead shrike (*Lanius ludovicianus*), Brewer's sparrow (*Spizella breweri*), lark sparrow (*Chondestes grammacus*), savannah sparrow (*Passerculus sandwichensis*), grasshopper sparrow (*Ammodramus savannarum*), brewer's blackbird (*Euphagus cyanocephalus*), and brown-headed cowbird (*Molothrus ater*) (Apa 1993).

Bird species recorded on the nearby Minidoka National Wildlife Refuge include 208 species that occur during one or more seasons of the year (FWS 1991). Many of the species identified on this list are waterfowl or other species associated with wildlife habitat on the Refuge and would not be expected to occur in the cropland and sagebrush-steppe of the affected environment.

Mammals occurring in the affected environment include mule deer (*Odocoileus hemionus*), pronghorn (*Antilocapra americana*), small mammals, coyotes (*Canis latrans*), jackrabbits (*Lepus* spp.), cottontails (*Sylvilagus* spp.), pygmy rabbit (*Brachylagus idahoensis*), striped skunk (*Mephitis mephitis*), badger (*Taxidea taxus*), muskrat (*Ondatra zibethica*), longtail weasel (*Mustela frenata*) and shorttail weasel (*Mustela erminea*), and red fox (*Vulpes fulva*) (Reclamation 1987; Apa 1993). A single red fox was the only mammal species observed during the June 1993 field reconnaissance survey. Bobcats (*Lynx rufus*), raccoons (*Procyon lotor*), and spotted skunks (*Spilogale putorius*) may also occur in the area (Reclamation 1986).

Mule deer utilize sagebrush habitat within the affected environment for winter habitat. Although this habitat is considered low value, it is important because it provides large open range to migrate to during severe winters (FWS 1985). A small herd of pronghorn also utilizes sagebrush habitat within the affected environment.

Small mammals documented for the affected area include vagrant shrews (*Sorex vagrans*), deer mouse (*Peromyscus maniculatus*), western harvest mouse (*Reithrodontomys megalotis*), and western jumping mouse (*Zapus princeps*) (Reclamation 1986). A mammal list for the nearby Minidoka National Wildlife Refuge is shown in Appendix C (FWS 1975).

A list of reptiles recorded for the Minidoka National Wildlife Refuge is shown in Appendix D (FWS n.d.). The gopher snake, striped whipsnake, and western rattlesnake have all been documented occurring in the affected environment (Reclamation 1987).

No amphibians were observed within the affected environment during the 1993 summer field reconnaissance survey. Apa (1993) reported hearing a Great Basin spadefoot toad (*Spea intermontana*) in the affected environment in 1993. The tiger salamander (*Ambystoma tigrinum*), western toad (*Bufo boreas*), and northern leopard frog (*Rana pipiens*) are known to occur within the affected environment (Reclamation 1987). The diversity and abundance of amphibians in the affected environment are expected to be low due to the seasonal nature of suitable aquatic habitat.

No aquatic life was observed within the affected environment during the 1993 summer field reconnaissance survey. Because aquatic habitat is limited to intermittent flows in the main drains and ponds associated with the irrigation distribution system, the diversity and abundance of aquatic life in the affected environment is expected to be minimal.

2. Environmental Consequences

Alternative A - Integrated Wetlands and Reuse (Preferred Alternative)

Vegetation

Environmental consequences to vegetation cover types identified for Alternative A include direct and indirect impacts. Direct impacts to vegetation resulting from the creation of wetlands could include a change in cover type at wetland creation sites and associated watersheds. These impacts could include beneficial and adverse impacts depending on the areal extent and relative abundance of impacted cover types and local management objectives. Embankment construction and associated water impoundment could result in a change from grassland, shrub-steppe, or farmland cover types to a wetland cover type. The acreage loss of grassland, shrub-steppe, and farmland cover types is expected to be minimal relative to the total acreage of these cover types available within the affected environment. A maximum of 700 acres of created wetland habitat has been identified for this alternative. This change in cover type would result in significant beneficial impacts to the wetland cover types and minimal adverse impacts to upland cover types.

Creation of impoundments or installation of utility lines and pipelines for irrigation reuse may also result in direct impacts to grassland, shrub-steppe, or farmland cover types. Irrigation reuse impoundments may adversely impact upland cover types without increasing wetland acreage if the impoundments are too deep for establishment and maintenance of wetland plants. Acreage loss of upland cover types as a result of irrigation reuse is expected to be minimal, and in the case of pipeline installation, may be considered temporary.

Indirect impacts to vegetation could include subtle long-term changes in cover types due to changes in the existing water regime. Changes in irrigation return flows either through changes in volumes or existing drainage patterns, could effect the existing vegetation cover type composition within the affected environment. This change may occur over time as a result of changes in surface and groundwater hydrology and may not be recognized as an impact from Alternative A. Other ongoing activities, particularly agriculture also contribute to this type of change. In summary, indirect impacts to vegetation are expected to be minimal.

Wildlife

The creation of wetland habitat will have a direct benefit to aquatic and wetland wildlife species by increasing available habitat and enhancing existing wetlands. Terrestrial wildlife also utilize wetland habitat during selected life stages or seasons. For example, ringed-neck pheasants utilize dense wetland vegetation during winter months for cover. Benefits to terrestrial wildlife species from creation of wetland habitat may be offset by the loss in upland habitat.

Terrestrial wildlife associated with shrub-steppe, grassland, and farmland cover types would experience a direct loss of upland habitat as a result of Alternative A. However, the loss of upland habitat to terrestrial wildlife is expected to be restricted to existing drainages and should have minimal adverse impact to these species. The acreage of shrub-steppe and other habitats converted for wetland creation and reuse will depend, in part, on the location of wetlands and reuse. Due to the relative abundance of the shrub-steppe habitat in southcentral Idaho, loss of this cover type is not expected to have significant adverse impacts to wildlife.

Indirect impacts to wildlife as a result of wetland creation include adverse and beneficial impacts to populations. Temporary or irrigation reuse wetlands that provide nesting habitat for waterfowl could increase local production for these species; however, if these wetlands dry up due to lack of irrigation return flows or from pumping for irrigation reuse, any waterfowl production on these wetlands could be wasted if brood rearing habitat is eliminated.

Alternative B - Irrigation Reuse

Vegetation

Environmental consequences to vegetation as a result of Alternative B could include direct loss of vegetation and indirect change in cover type composition. Creation of irrigation reuse impoundments and installation of irrigation water pipelines, pumps, and utility lines would disturb existing vegetation. Temporarily disturbed areas for pipeline installation would eventually recover; however, impoundments and permanently disturbed areas would result in a permanent loss of vegetation. Adverse impacts to vegetation as a result of construction are expected to be minimal.

Conversion of approximately 1,000 acres of existing shrub-steppe lands to irrigated cropland from reuse of irrigation return flows could result in a direct loss of upland cover-type acreage. Given the historical conversion and degradation of native vegetation within the affected area, additional permanent loss of shrub-steppe acreage from conversion to irrigated cropland may result in some adverse impacts to this cover type.

Wildlife

Environmental consequences to wildlife as a result of Alternative B include direct loss of wildlife habitat and long-term changes in habitat. Conversion of existing uplands to irrigated cropland using return flows will reduce available habitat for terrestrial wildlife species. Expansion of irrigated lands within the affected environment as a result of this alternative could adversely impact small and large mammals dependent on shrub-steppe habitat.

Irrigation water reuse and associated reduced irrigation return flows could reduce existing wetland acreage and/or degrade existing wetlands. Indirect loss or degradation of wetland habitat could adversely impact waterfowl and other wetland dependant species.

Alternative C - No Action

Vegetation

The four vegetative cover types within the affected environment are not expected to be adversely impacted by the No-Action alternative. Under this alternative, existing plant species and communities are expected to remain in the same relative abundance and diversity as current conditions.

Wildlife

Wildlife within the affected environment are not expected to be adversely impacted by the No-Action alternative. The diversity, distribution, and relative abundance of wildlife, and their habitat, are expected to remain the same as current conditions under the No-Action alternative.

3. Mitigation

Alternative A - Integrated Wetlands and Reuse (Preferred Alternative

Vegetation

Existing upland vegetation may be removed or otherwise destroyed as a result of wetland creation and irrigation reuse activities. All ground disturbance areas would be revegetated as soon as possible to limit erosion and down stream sedimentation. Revegetation of wetland creation sites will include seeding and planting of selected wetland species. Revegetation of upland sites would include seeding and/or planting of native upland species in coordination with local FWS and IDFG representatives.

Wildlife

Wildlife mitigation for Alternative A may require water level control structures in created wetlands to maintain water levels for waterfowl feeding, resting, nesting, and brood rearing habitat. Wildlife mitigation for loss of shrub-steppe habitat may include management of nearby unmanaged shrub-steppe habitat, or assistance to IDFG for management of existing shrub-steppe habitat for upland wildlife.

Alternative B - Irrigation Reuse

Vegetation

Mitigation for vegetation impacts resulting from Alternative B include revegetation of disturbed areas and management of conversion lands. Installation of impoundments, pipelines, and utility lines for reuse of irrigation return flows may temporarily or permanently remove existing vegetation. Temporarily disturbed areas would be reseeded or planted with appropriate upland or wetland plant species as soon as possible following disturbance. Loss of upland cover types as a result of conversion to irrigated cropland may be mitigated as discussed in the wildlife mitigation section below.

Wildlife

Conversion of existing upland habitat to irrigated cropland will destroy wildlife habitat for terrestrial mammals and birds. Mitigation for loss of wildlife habitat may include wildlife management of existing unmanaged habitat, enhancement of existing wildlife habitat, and/or management of converted lands to provide food and cover requirements for wildlife species. Detailed mitigation measures would be developed in coordination with appropriate state, federal, and local agencies and landowners.

Alternative C - No Action

No need for mitigation was identified for vegetation and wildlife resources within the affected environment as a result of the No-Action alternative.

D. Wetlands

1. Affected Environment

Palustrine wetland classes identified from National Wetlands Inventory (NWI) maps of the affected environment include primarily emergent, scrub-shrub, unconsolidated bottom, and unconsolidated shore wetlands. The emergent wetlands are dominated by cattail and/or bulrush. Rush (*Juncus* spp.) and other less abundant hydrophytic species also occur in these emergent wetlands. Examples of palustrine emergent wetlands within the affected environment include Cap Hawley and E pond at the terminus of F Main and E Main Drains, respectively. Scrub-shrub wetlands are uncommon in the affected environment and are dominated by woody vegetation including willow (*Salix* spp.). Examples of scrub-shrub wetlands include the willow thickets along the Snake River. Unconsolidated shore and unconsolidated bottom palustrine wetland classes occur primarily as small open water bodies along drainages. These open water bodies are typically associated with canals and other features of the irrigation distribution system and are classified as excavated wetlands.

The water regime for palustrine wetlands in this area is generally either temporarily or seasonally flooded. Local wetlands are generally supported by surface water from irrigation return flows. Groundwater in the affected environment is generally too deep to inundate or saturate soils within the root zone of hydrophytic vegetation during the growing season for sufficient duration to support wetlands. Precipitation during the summer growing season is also generally insufficient to support palustrine wetland vegetation.

Jurisdictional wetlands are identified in accordance with the U.S. Army Corps of Engineer's (Corps) current *Wetlands Delineation Manual.* They are under the jurisdiction of the Corps and Section 404 of the Clean Water Act. A jurisdictional delineation of wetlands within the study area has not been performed.

Riverine wetlands within the affected environment are primarily intermittent streambeds represented by main or lateral drainages. The water regime for riverine wetlands consists of surface water from precipitation and irrigation return flows; however, the supporting wetland hydrology is primarily irrigation return water.

A summary discussion of definitions and wetland criteria within the study area is provided in Appendix E.

2. Environmental Consequences

Alternative A - Integrated Wetlands and Reuse (Preferred Alternative)

Closure of existing groundwater injection wells could directly benefit existing wetlands by increasing the volume and duration of water supplied to current wetland habitat. Creation of wetlands to impound and/or filter irrigation return flows would also increase the net acreage by up to 700 acres of this cover type in the affected environment.

Indirect impacts to wetlands include enhancement and enlargement of existing wetlands through increases in available water supply and in duration of wetland inundation and/or soil saturation. These benefits to existing wetlands would occur over time as a result of improved wetland hydrology. Areas adjacent to or within existing wetlands that are currently inundated or saturated for less than two weeks during the growing season may, as a result of increased water availability, experience an increase in wetland vegetation.

Additional indirect impacts to wetlands as a result of Alternative A could include habitat degradation due to increased recreation use of these areas for hunting and non-consumptive activities. Although it is difficult to anticipate the level of recreational activity, trash dumping, erosion, and increased sedimentation of wetland habitat could occur if large created wetlands are utilized by the public.

Alternative B - Irrigation Reuse

Use of irrigation return flows for irrigation reuse could decrease the amount and duration of return flows in existing drainage wetlands, thereby directly reducing wetland acreage.

Indirect impacts to wetlands resulting from Alternative B could include long-term changes in wetland types through changes in surface and groundwater hydrology. Irrigation reuse could result in reduced irrigation return flows in drainages and a gradual change in drainage vegetation over time. Conversion of existing upland habitats to irrigated cropland could also create seasonal wetlands in associated drainages and result in increased erosion and sedimentation associated with farming.

Alternative C - No Action

Wetlands within the affected environment are not expected to be adversely impacted by the No-Action alternative. Existing wetland acreage, types, functions, and values are expected to remain the same as current conditions under the No Action alternative. Existing wetlands may be adversely effected by a decrease in irrigation return flows associated with a trend from flood to sprinkler irrigation.

3. Mitigation

Alternative A - Integrated Wetlands and Reuse (Preferred Alternative)

Wetland sites created as a result of Alternative A would require maintenance and management to minimize impacts to this and other resources. Signs would be posted at wetland creation sites prohibiting dumping, pumping, shooting, or other activities deemed inappropriate to management objectives.

Management of created wetlands would be required to maintain wetland functions and values. Created wetlands will require periodic sediment removal without removal of wetland vegetation. However, vegetation management may include control of dense stands of cattails. Where appropriate, water level control structures would be installed at each permanent wetland to manipulate water levels for cattail control.

Creation of wetland sites for Alternative A would consider the number and type of wetlands that can be practically developed and managed. For example, numerous small permanent wetlands throughout the ABID could be problematic to develop and manage and could result in long-term degradation of created wetlands. Development and management of permanent wetlands can include construction, seeding, planting, monitoring, and maintenance. Wetland maintenance could include periodic dredging of sediment basins, seeding or planting, and embankment repairs. Indirect impacts associated with development and management of wetlands could include loss and/or degradation of adjacent cover types from access roads and staging areas.

Prior to specific development activities associated with the North Side Drainwater Management Plan, Reclamation would consult with the Corps and FWS to perform a jurisdictional wetland delineation. If it is determined that jurisdictional wetlands would be affected, Reclamation would obtain necessary permits under the Clean Water Act and develop mitigation measures as needed.

Alternative B - Irrigation Reuse

Dredging, filling, or pumping existing wetlands for irrigation reuse associated with Alternative B would be avoided to the extent possible. Dredging and/or filling activities associated with jurisdictional wetlands will require a Section 404 Permit from the Corps. Loss or degradation of existing wetland habitat due to pumping for irrigation reuse may require creation or enhancement of wetland habitat to offset impacts.

Alternative C - No Action

No need for mitigation was identified for wetlands within the affected environment as a result of the No-Action alternative.

E. Threatened, Endangered, and Sensitive Species

1. Affected Environment

Species of special concern within the affected area are defined as IDFG species of special concern, threatened, endangered, and protected nongame wildlife, and Federal threatened and endangered, and candidates for federal threatened and endangered (T&E) status. The following categories are included in this resource definition:

- *Sensitive species* -- This category includes priority, peripheral, and undetermined status animal species as identified by IDFG.

- *Federal T&E species* -- This category includes all federally listed, proposed, and candidate species. State endangered species for the study area are also listed as Federal endangered species.

T&E species refer to Federally listed, proposed, and candidate species. Listed species are those species identified as threatened or endangered by the FWS in accordance with the Endangered Species Act (ESA) of 1973, as amended; these species have legal protection under the ESA. Proposed species are those species proposed for listing as threatened or endangered. Candidate species are also being considered for listing as threatened or endangered and are divided into three categories:

- *Category I (C1)* is comprised of taxa for which the FWS currently has substantial information to support the biological appropriateness of proposing to list the species as threatened or endangered. Development and publication of proposed rules on these taxa are anticipated;

- *Category 2 (C2)* is comprised of taxa for which the FWS information indicates that proposing to list may be appropriate, but for which conclusive data on biological vulnerability and threat are currently not available to support development of proposed rules; and

- *Category 3 (C3)* is comprised of taxa that were once under consideration for listing as threatened or endangered but are either now extinct, no longer taxonomically recognized as a species or subspecies, or are more widespread and abundant than previously thought.

Candidate species do not have legal protection under the ESA. However, all candidate species are BLM sensitive species and are managed for their protection.

Sensitive species for the affected environment were identified by the FWS, Idaho Conservation Data Center (CDC), consultation with resource agencies, and review of previous environmental documents (Table 3-2). The FWS provided a memorandum listing the endangered, threatened, candidate and/or proposed species which may be present in the NSPD; this memorandum is included as Appendix F.

Table 3-2

Species of Special Concern Identified
for the North Side Drainwater Management Plan

Common and Scientific Name	*Status*1	*Comments*
Bliss Rapids snail (undescribed species)	FT	associated with Snake River
Utah valvata snail (*Valvata utahensis*)	FE	associated with Snake River
Idaho springsnail (*Pyrgulopsis idahoensis*)	FE	associated with Snake River
Banbury Springs limpet (*Lanx* spp.)	FE	associated with Snake River
Snake River physa snail (*Physa natricina*)	FE	associated with Snake River
Bald eagle (*Haliaeetus leucocephalus*)	FE	wintering range
Peregrine falcon (*Falco perigrinus*)	FE	rare visitor during migration
Loggerhead shrike (*Lanius ludovicianus*)	C2	within known range
Pygmy rabbit (*Brachylagus idahoensis*)	C2	within known range
Idaho Dunes tiger beetle (*Cincindela arenicola*)	C2	within known range

Note: 1. FE = Federal endangered; FT = Federal threatened; C2 = Category 2.
Source: CDC 1993; FWS 1993.

There were no threatened, endangered or special concern plant species identified by federal or state natural resource agencies.

No sensitive species were recorded within the affected environment during the summer 1993 field reconnaissance survey. The five Federally listed aquatic snail species identified in Table 3-2 are associated with ". . . free-flowing reaches or spring alcove habitat in the middle Snake River . . . ." (Federal Register 1992). None of these species or their habitat have been identified for the affected area.

The bald eagle has been documented by CDC as a winter resident within Minidoka and surrounding counties. The Minidoka National Wildlife Refuge identifies the bald eagle as a common winter and spring visitor, uncommon fall visitor, and occasional summer visitor (FWS 1991).

The peregrine falcon has been identified as a rare visitor to the NSPD for foraging. Potential habitat exists along the Snake River. Within the affected area, potential habitat exists for the loggerhead shrike, but no surveys have been performed to document them.

CDC did not identify documented occurrences of the pygmy rabbit within the study area; however, this species was identified as an upland game species for the North Side Pumping Division Extension Planning Report (Reclamation 1986).

The Idaho Dunes Tiger Beetle was observed in five sections north of the Minidoka Dam and south of Minidoka in 1992 (CDC 1993). The tiger beetle sightings consisted of adults and larval burrows and were associated with active sand dunes and sparse vegetative cover. Shrub cover on the dunes was sparse and beetles appeared to be scarce at the five locations.

No critical habitat for Federal T&E species was identified for the affected environment.

2. Environmental Consequences

Alternative A - Integrated Wetlands and Reuse (Preferred Alternative)

Environmental consequences to sensitive species for Alternative A are not anticipated as a result of that alternative. The five species of aquatic snails are not known or expected to occur within the affected environment due to a lack of habitat. Increased consumptive use as a result of Alternative A could potentially affect the Snake River by reducing groundwater recharge and reducing water levels in the Snake River. No hydrologic data exists to support this potential adverse effect. The closed basin nature of much of the affected area and the distance from the

Snake River indicate that any potential adverse effects to the Snake River would be insignificant. Therefore, surveys were not conducted for these snail species and adverse impacts to these species or their habitat are not anticipated as a result of Alternative A.

Habitat for the pygmy rabbit occurs within the affected environment and includes tall sagebrush. Loss of sagebrush habitat due to Alternative A is expected to be minimal and adverse impacts to the pygmy rabbit are considered negligible.

The bald eagle utilizes the Lake Walcott area during the winter and may be observed migrating or soaring within the affected environment. This species is not expected to be adversely impacted by Alternative A and may actually benefit from the creation of wetland habitat. This may also be true for the peregrine falcon.

The Idaho Dunes Tiger Beetle has been documented within the affected environment north of Minidoka Dam. The creation of wetlands and reuse of irrigation return waters is not expected to adversely impact this species or its upland dunes habitat.

<u>Alternative B - Irrigation Reuse</u>

The five species of aquatic snails are not expected to be adversely impacted by Alternative B. Reuse of irrigation return flows and irrigation of additional lands within the affected environment should not impact the Snake River habitat of these species.

Increased consumptive use as a result of Alternative B could potentially effect the Snake River by reducing groundwater recharge and reducing water levels in the Snake River. No hydrologic data exists to support this potential adverse effect. The closed basin nature of much of the study area and the distance from the Snake River indicate that any potential adverse effects to the Snake River would be insignificant.

Conversion of existing sagebrush habitat to cropland could adversely impact the pygmy rabbit and Idaho Dunes Tiger Beetle. These species have been recorded within this cover type in the affected environment. Loss of suitable habitat for these species may adversely impact local populations and their ability to expand.

The bald eagle is a winter resident of the affected environment and is not expected to be adversely impacted by Alternative B.

Alternative C - No Action

Threatened, endangered, and sensitive species within the affected environment are not expected to be adversely impacted by the No-Action alternative. The diversity, distribution, and relative abundance of these species, and their habitat, are expected to remain the same as current conditions under the No-Action alternative. No adverse impacts to the water levels of the Snake River are anticipated as a result of the No-Action alternative. Any potential adverse effects to Snake River water quality from this alternative are expected to be insignificant.

3. Mitigation

Alternative A - Integrated Wetlands and Reuse (Preferred Alternative)

No mitigation will be required for species of special concern.

Alternative B - Irrigation Reuse

Alternative B may adversely impact the pygmy rabbit and Idaho Dunes Tiger Beetle by converting sagebrush habitat to irrigated cropland. Surveys of proposed conversion lands would be conducted for these species prior to conversion. Habitat occupied by these species would be avoided to the extent possible. Identified impacts to these species could be mitigated by enhancement, management, or creation of habitat for the pygmy rabbit and Idaho Dunes Tiger Beetle.

Alternative C - No Action

No need for mitigation was identified for threatened, endangered, and sensitive species within the affected environment as a result of the No-Action alternative.

F. Cultural Resources

1. Affected Environment

Archaeologists have uncovered evidence of over 14,000 years of human habitation in the region (Butler 1978, 1986; Druss and Druss n.d.). Artifacts and modified bone dating to the late Pleistocene have been recovered from sites within 20 miles of the project area within the Snake River Plain. Through time, there is a change from small, temporary sites to larger campsites with intensive hunting and wild plant gathering. There is additional evidence from the Snake River region that Numic-speaking peoples, like the present day Shoshone, moved into the area around 1300 A.D. At the time of historic contact, the Shoshone and Bannock were living in southern Idaho. Although there was frequent contact between Euroamericans and Native Americans during the first half of the nineteenth century, the project area was not settled to any extent until the late nineteenth and early twentieth centuries.

Most of the farming in the area was not successful until large-scale irrigation projects were implemented. The Minidoka Project was begun in 1904 to bring water to dry lands and expand farming. Most of the construction of dams, canals, and drains and the settlement took place near the Snake River south of the current project area. The NSPD was the last of the Minidoka Project areas to be irrigated. It was constructed in 1959. However, there were attempts to farm the area in the early twentieth century, although they were largely unsuccessful.

Five intensive archaeological surveys have been performed within the ABID boundaries. In all, over 5,600 acres out of the 77,000 acres within the district have been surveyed. The surveys include: 2.5 miles of proposed fenceline (Henrikson 1991); 3 acres for a powerline installation (Laudeman 1992); 310 acres for a proposed sewage treatment project (Ross 1989); a Class III survey of approximately 2,900 acres of wildlife tracts in the North Side Pumping Division and adjacent lands (Ross 1990); and a Class II sample survey of 2,440 acres (61 40-acre sample units) in the NSPD and adjacent lands (Druss 1984). The intensity of the survey is unknown for the first three projects. The sewage treatment project (Ross 1989), the wildlife tract survey (Ross 1990), and the sample survey (Druss and Druss n.d.) yielded archaeological sites. As a continuation of the sewage treatment project, six historic trash dumps were tested (Druss 1989). The trash dumps were primarily composed of household refuse deposited in multiple episodes during the early twentieth century. The State Historic Preservation Officer (SHPO) concurred that none of the sewage treatment plant sites are considered to be eligible to the National Register.

A total of 48 archaeological sites have been recorded within the district boundaries (Table 3-3). These sites include 22 prehistoric sites, 24 historic sites, and 2 sites of unknown age. Of the prehistoric sites, 16 are defined as lithic scatters, 3 are rock alignments, and 3 are campsites. Of these 22 sites, 6 sites are eligible to the National Register, while 12 lack sufficient information to determine eligibility, 1 is considered to be potentially not eligible, and 3 are not eligible. The SHPO has concurred that 6 sites are eligible and 3 are not eligible for the National Register.

The historic sites are composed of 19 trash dumps, 1 stone structure, 1 fenceline foundation, and 3 wagon or stage road remnants. None of these sites are considered to be eligible to the National Register; 10 sites need additional information to determine eligibility. The SHPO has concurred that 12 sites are not eligible for the National Register. An examination of the Government Land Office survey maps at the BLM office in Boise and historic topographic maps at Boise State University shows four historic roads: the Montgomery Ferry to Minidoka road, the Overland Stage road, the Northside Alternate trail, and the Starr's Ferry to Shoshone road.

Table 3-3

Archaeological Sites Located within the A & B Irrigation District

Number	*Type*	*Condition*	*Eligibility*	*Well Designation*
10 JE 80	Historic can scatter	Poor	Not eligible*	
10 JE 81	Prehistoric lithic scatter	Good	Eligible*	
10 JE 82	Prehistoric lithic scatter	Good	Eligible*	
10 JE 83	Historic can/glass scatter	Poor	Not eligible*	
10 JE 84	Historic can scatter	Fair	Not eligible*	
10 JE 85	Historic can scatter	Good	Not eligible*	
10 JE 86	Historic can scatter	Good	Not eligible*	
10 JE 78	Unknown rock alignment	Excellent	Not eligible*	
10 JE 79	Prehistoric lithic scatter	Fair	Eligible*	
10 MA 35	Prehistoric lithic scatter	Poor	Not eligible*	32 AD 824
10 MA 36	Historic dump	Poor	Not eligible*	32 AD 824
10 MA 37	Historic dump	Poor	Not eligible*	
10 MA 38	Historic dump	Fair	Not eligible*	
10 MA 39	Prehistoric lithic scatter	Good	Potentially not eligible	
10 MA 40	Prehistoric lithic scatter	Good	Unevaluated	27 AD 824
10 MA 41	Prehistoric lithic scatter	Good	Eligible*	27 AD 824
10 MA 42	Historic can scatter	Fair	Potentially not eligible	27 AD 824
10 MA 43	Prehistoric lithic scatter	Poor	Not eligible*	
10 MA 45	Prehistoric lithic scatter	Poor	Not eligible*	24 AD 824
10 MA 46	Historic dump	Fair	Not eligible*	32 AD 824
10 MA 28	Prehistoric rock alignment	Excellent	Unevaluated	
10 MA 26	Prehistoric lithic scatter	Good	Unevaluated	
10 MA 27	Historic dump	Excellent	Unevaluated	
10 MA 25	Prehistoric lithic scatter	Good	Unevaluated	
10 JE 65	Unknown rock alignments/depressions	Unknown	Unevaluated	
10 JE 66	Prehistoric lithic/tool scatter	Excellent	Unevaluated	
10 JE 64	Historic fenceline foundation	Good	Not eligible	
10 JE 62	Prehistoric campsite	Poor	Eligible*	
10 JE 63	Prehistoric campsite	Unknown	Eligible*	
10 JE 57	Historic dump	Excellent	Unevaluated	
10 JE 56	Historic stone structure	Fair	Unevaluated	
10 JE 55	Prehistoric rock alignment	Excellent	Unevaluated	
10 JE 58	Prehistoric lithic scatter	Fair	Unevaluated	
10 JE 61	Prehistoric lithic scatter	Fair	Unevaluated	
10 JE 59	Historic stage road	Good	Unevaluated	
10 JE 53	Prehistoric rock alignment	Excellent	Unevaluated	
10 MA 24	Historic dump	Excellent	Unevaluated	
10 JE 54	Prehistoric campsite	Good	Unevaluated	
10 MA 14	Historic road	Fair	Unevaluated	
10 MA 17	Historic dump	Good	Not eligible*	
10 MA 16	Historic dump	Good	Not eligible*	32 AD 824
10 MA 15	Historic dump	Excellent	Not eligible*	
10 MA 18	Prehistoric lithic scatter	Good	Unevaluated	25 AD 824
10 MA 19	Historic dump	Good	Unevaluated	25 AD 824
10 MA 20	Historic dump	Excellent	Unevaluated	25 AD 824
10 MA 21	Historic dump	Excellent	Unevaluated	25 AD 824
10 MA 22	Historic wagon road	Excellent	Unevaluated	19 AD 825
10 MA 23	Prehistoric lithic and toll scatter	Fair	Unevaluated	

* SHPO Concurrence with Eligibility

All of these roads date to the late nineteenth century. The significance and condition of these resources is presently unknown. All of the historic roads are greater than 1/2 mile from an existing drainwell.

Two rock alignments within the district may be either prehistoric or historic in age. One of these alignments is not eligible to the National Register and the other has not been evaluated.

A site location model was developed for lands within and adjacent to the ABID as part of the North Side Extension Project (Druss and Druss n.d.). The authors used a review of the literature and historic maps and sources to construct a site prediction model that utilized slope and soil data from Reclamation's Land Classification System. This system divided soils into four land classes: Class 1 Arable soil (fine sandy loam with 0-7 percent slopes); Class 2 Arable soil (sandy loam to clay with 7-12 percent slopes); Class 3 Arable soil (loamy sand to clay with 12-20 percent slopes); and Class 6 Non-Arable soil. Based on the locations of known sites, slope, and soil classes, the authors suggested that prehistoric campsites and hunting stations were most likely to be found in Class 1 and Class 2 classification areas, while hunting blinds and quarries were most likely found in Class 3 and Class 6 areas. Most prehistoric sites should be found on Class 1 and 2 soils, with fewer sites occurring on Class 3 soils. Class 6 soils have a low potential for containing prehistoric sites. Historic homesteads tended to be found on Class 1 and 2 soils with dumps located at Class 3 and 6 soils. In general, the most sites and the sites most likely to be considered to be significant (prehistoric campsites, historic homesteads) are found on Class 1 and 2 soils. Maps with the distributions of these land classes are stored at the ABID office (personal communication, Ketchum 1993).

The lands in the immediate vicinity of the drainwells have been disturbed in a number of ways including the construction of earthen dams, canals, drainage ponds, gravel and dirt roads, agricultural facilities, and farming activities including plowing and discing. The degree of disturbance varies at each of the wells; however, the condition of the well sites has not been assessed for each of the locations.

2. Environmental Consequences

Alternative A - Integrated Wetlands and Reuse (Preferred Alternative)

Potential impacts to cultural resources could result from the development of multiple wetlands covering a total area of 700 acres, and the installation of utility lines and pipelines for irrigation reuse. Wetland development could disturb cultural resources, since they involve embankment construction, excavation, and water impoundment. Development of wetlands could also bury cultural remains and remove them from access for scientific research. Archaeological sites could be disturbed by plowing, discing, placement of irrigation systems and vehicles. Cultivation also makes sites more visible, rendering them more vulnerable to collection and other forms of vandalism.

Although the exact placement of wetlands has not been decided, wetlands will be developed in the vicinity of existing drainwells. In order to determine the potential affect of wetland development on known archaeological sites, the presence of significant archaeological sites within 1/2 mile of an existing drainwell was examined (Table 3-4). Eleven drainwells have been either totally or partially surveyed. A total of 13 archaeological sites are found within 1/2 mile of open drainwells; 7 of these sites are considered to be significant or to warrant further investigations. None of the ditches, drainwells, or other facilities associated with NSPD are considered to be significant since they are all less than 50 years old. Therefore, no impacts are expected to these facilities.

Alternative B - Irrigation Reuse

Under this alternative, potential impacts to archaeological sites could result from the conversion of 1,000 acres of undeveloped lands to irrigated cropland and from the creation of irrigation reuse impoundments with the installation of pipes, pumps, and utility lines. Archaeological sites

Table 3-4

Cultural Resources in the Vicinity of Injection Wells

Drain	Well Designation	Well Location Surveyed	Surveyed (within 1/2 mile)	Sites Adjacent to Well Location	Sites (within 1/2 mile)	Eligibility	Additional Work Needed
		No	No	No	No		Survey
P	33 AD 922	No	No	No	No		Survey
Q	13 AD 1021	No	No	No	No		Survey
T	3 AD 1022	Yes	Yes	No	No		None
J	12 AD 922	Yes	Yes	No	No		None
K	11 AD 922	No	No	No	No		Survey
G	10 BD 823	No	No	No	No		Survey
G	10 CD 823	No	No	No	No		Survey
G	21 CD 823	No	No	No	No		Survey
G	22 AD 823	No	No	No	No		Survey
G	22 CD 823	No	No	No	No		Survey
G	22 BD 823	No	No	No	No		Survey
G	22 FD 823	No	No	No	No		Survey
G	27 AD 823	No	No	No	No		Survey
G	27 BD 823	No	No	No	No		Survey
G	34 AD 823	No	No	No	No		Survey
G	34 CD 823	No	No	No	No		Survey
G	34 DD 823	No	No	No	No		Survey
H	5 AD 823	No	Partially	No	No		Survey
G	4 AD 823	No	No	No	No		Survey
G	5 AD 823	No	No	No	No		Survey
G	10 AD 823	No	No	No	No		Survey
F	11 AD 823	No	No	No	No		Survey
G	14 BD 823	No	No	No	No		Survey
G	14 AD 823	No	No	No	No		Survey
G	22 ED 823	No	No	No	No		Survey
G	22 DD 823	No	No	No	No		Survey
G	26 DD 823	No	No	No	No		Survey
G	25 BD 823	No	No	No	No		Survey
G	26 BD 823	No	No	No	No		Survey
G	26 AD 823	No	No	No	No		Survey
G	25 AD 823	No	No	No	No		Survey
G	25 AD 823	No	No	No	No		Survey
G	34 BD 823	No	No	No	No		Survey
G	34 ED 823	No	No	No	No		Survey
G	35 AD 823	No	No	No	No		Survey
F	32 AD 824	Yes	Yes	No	10 MA 35	Not Eligible*	None
					10 MA 36	Not Eligible*	None
					10 MA 16	Not Eligible*	None
					10 MA 46	Not Eligible*	None
E	27 AD 824	No	Partially	No	10 MA 40	Unevaluated	Testing, Survey
					10 MA 41	Eligible*	Avoidance, Data Recovery
					10 MA 42	Potentially not eligible	SHPO Consultation
	F-5-1-2	No	No	No	No		Survey
C	17 AD 825	No	No	No	No		Survey
D	13 AD 824	No	No	No	No		Survey
D	24 BD 824	No	No	No	No		Survey
E	23 AD 824	No	No	No	No		Survey
D	24 AD 824	No	Partially	No	10 MA 45	Not Eligible*	Survey
D	24 CD 824	No	Partially	No	10 MA 45	Not Eligible*	Survey
D	19 AD 825	No	Partially	No	10 MA 22	Unevaluated	Testing, Survey
C	26 AD 824	No	No	No			Survey
D	25 AD 824	No	Partially	No	10 MA 18	Unevaluated	Testing, Survey
					10 MA 21	Unevaluated	Testing, Survey
					10 MA 19	Unevaluated	Testing, Survey
					10 MA 20	Unevaluated	Testing, Survey
C	29 BD 825	Yes	Yes	No	No		None
C	29 AD 825	Yes	Yes	No	No		None
D	25 CD 824	No	Partially	No	No		Survey
	26 AD 724	No	No	No	No		Survey
D	1 AD 824	No	No.	No	No		Survey
C	32 AD 724	No	No	No	No		Survey

could be disturbed by plowing, discing, and placement of irrigation systems. However, since the location of the new irrigated lands has not been determined, the impact on cultural resources is unknown.

Alternative C - No Action

Under this alternative, the drainwells will continue to be used and further development of wetlands or new irrigated lands is not proposed. No impacts to cultural resources are expected.

3. Mitigation

Alternative A - Integrated Wetlands and Reuse (Preferred Alternative)

Initial site studies to identify areas to be developed as wetlands or used as additional cropland could concentrate on those already surveyed with no known sites in the vicinity or those with Class 6 soils. Once specific development areas and areas expected to be affected by pipes and construction are identified, Class III (30 meter transects) cultural surveys would need to be conducted on all impact areas not previously surveyed or surveyed using less intensive methods before the areas are disturbed. The purpose of the survey is to identify any cultural resources in the area and to document the level of recent disturbance. If cultural resources are discovered or known to occur in the area, they would be evaluated as to their eligibility to the National Register. Sites found to be eligible to the National Register after consultation between Reclamation and the SHPO would be avoided or impacts would be minimized through a treatment plan that would be reviewed by the SHPO and the Advisory Council on Historic Preservation. As part of the site-specific studies at the affected locations, consultation with Native Americans would take place concerning the presence of traditional use areas or sacred areas within the project boundaries.

Alternative B - Irrigation Reuse

Measures to lessen impacts under this alternative would be similar to Alternative A. All areas designated as new irrigated lands or the site of new distribution facilities not previously surveyed would be examined by a professional archaeologist. Cultural resources discovered in the area would be evaluated and, if necessary, mitigated. Mitigation measures could be derived through consultation with the SHPO and the Advisory Council and may include data recovery or avoidance.

Alternative C - No Action

Since there are no impacts to cultural resources, no mitigation measures are proposed. Only actions that are part of a federal undertaking will require mitigation if significant resources are affected. Consultation with the SHPO will be conducted to determine which actions are federal undertakings after the project elements are defined more completely.

G. Socioeconomics

1. Affected Environment

The population of Minidoka County was 19,361 as of 1990, slightly less than the population in 1980 (Idaho Department of Commerce 1990). The majority of the population resides in Rupert and Heyburn, and other smaller communities in the Snake River Plain.

Irrigated agriculture is the largest contributor to the economy in Minidoka County (Idaho Department of Commerce 1990). By comparison, the economic value of grazing and other agricultural production on dry lands is relatively low. In 1987, there were 858 farms in Minidoka County, with an average size of 242 acres. Potatoes, chickens, cheese processing, sugar processing, and grain handling are local food product industries.

The estimated gross agricultural revenue for Minidoka County in 1988 was $116 million. The leading crops, in terms of gross value, included potatoes at $36 million, sugar beets at $31 million, wheat at $19 million, and barley at $17.5 million (University of Idaho 1988). Other important crops include alfalfa, beans, onion seed, and radish seed. The total value of livestock in the county was $39.6 million during the same year, including mostly cattle, with some sheep and swine production. The above figures are for the total county production on 201,000 irrigated acres.

The NSPD includes 77,000 irrigated acres, or 38 percent of the irrigated acreage in the county. Total agricultural revenue in 1992 on the NSPD, reported by the ABID, was $51.5 million, or approximately 44 percent of the revenue in the county (personal communication, Temple 1993).

In 1992, revenues on the NSPD were $5.5 million for barley, $3.8 million for wheat, $9.6 million for potatoes, and $8.7 million for radish seed. Farmers on the NSPD also contribute to local economies by purchasing equipment, fertilizer, fuel, etc., and the hiring of employees from the local labor force. Irrigated agricultural lands in the southern part of the county are currently worth $1,500 - 2,000 per acre (personal communication, Bowen 1993).

Total employment in Minidoka County was 9,604 in 1990, including 1,469 farm employees, and 1,964 manufacturing employees primarily involved in food processing of locally produced agricultural products. Farm and manufacturing employment were each as large as wholesale and retail trade, and larger than government employment. Per capita income was $13,198 in 1990, or 86.5 percent of the state average (Idaho Department of Commerce 1990).

Minidoka County is served by six different rural electric companies, including Riverside Electric Cooperative, Idaho Power Company, Rural Electric, and East End Mutual Electric. The Cities of Rupert and Heyburn have their own municipal power companies operating within their city limits.

Telephone service is provided by Mountain Bell, and the Project Mutual Telephone Co-operative Association. Natural gas is provided by Intermountain Gas Company to the Rupert, Paul, and Heyburn areas. Cable television is provided by Cable View TV.

2. Environmental Consequences

Alternative A - Integrated Wetlands and Reuse (Preferred Alternative)

The preferred alternative would have some limited impacts on economics within the NSPD. Approximately 700 acres of agricultural and undeveloped grasslands would be converted to temporary or permanent wetlands. This represents less than one percent of the land area of the NSPD. Assuming existing agricultural lands represent approximately 25 percent of the 700 acres, then a 0.25 percent loss of gross agricultural revenue may result. This equates to about $125,000 per year lost due to the conversion of croplands to wetlands. Similar additional contributions to the local economy might also be lost in the form of unbought fertilizer, fuel, and other commodities.

This alternative should have no perceptible impact on employment, population, public utilities, or land use patterns. Land owners that have some lands taken out of production due to this alternative would be compensated possibly by the purchase of flood easements in lieu of fee title acquisition. Where possible, coordination with available public utilities would occur to insure the feasibility of installation of the various pumps necessary for both the wetlands and irrigation reuse system. Some potential minor economic benefits may result from improved water quality, such as slightly improved crop yields, or the need for less soil amendments. These benefits, however, are difficult to quantify.

The primary beneficial economic impact from the preferred alternative would be in the form of much improved wildlife habitat and hunting opportunities. Pheasants and waterfowl are examples of birds that would benefit from the creation of wetlands, riparian zones and other areas that would provide rearing habitat. As recently as the 1970s, IDFG check stations in the area recorded 700-800 hunters and 500 pheasants in a single day (personal communication, Palmer 1993). More recently, check stations in the same area have recorded only 20 hunters, and 7-8 pheasants. The economic impact of pheasant hunters can be estimated to be $30 per day, or an estimated $21,000 per weekend day during the hunting season for the NSPD (personal communication, Gilchrist 1993). Only a portion of this revenue would be captured by the local area for expenses such as fuel, ammunition, restaurants, and motels.

Pumpback/reuse systems may be installed to permit reuse of return flows to supplement groundwater pumping for currently irrigated lands. Some additional pumping may be required to flush wetlands and move irrigation return flows for reuse. All of these activities would have additional associated costs that are currently not accounted for in the operation of the ABID. A portion of the construction costs and all of the operating costs of this alternative would probably be passed along to the irrigation users in the district (personal communication, Temple 1993).

<u>Alternative B - Irrigation Reuse</u>

This alternative would affect approximately 1,000 acres of undeveloped Reclamation lands converting them for crop production and water storage for reuse of irrigation return flows. The average gross revenue for the ABID was $373 per acre in 1992, or a potential annual increase of $373,000 in new revenue from agriculture. Consumptive use of irrigation water could increase by 2,200 acre-feet per year based on an irrigation requirement of 2.15 feet per year, which would be paid by the end users on the ABID. Some additional pumping and new equipment would be required at an undetermined cost. It is likely that a portion of the construction cost, and all of the operating expenses would be passed along to the ABID users.

Some additional opportunities exist for the development of wildlife habitat, under this alternative, in conjunction with IDFG. A conservative estimate of an increase of 1,000 hunter-days per year would yield approximately $30,000, a portion of which would remain in the local area. This amount could be considerably higher, especially if hunting leases were to become viable in the area.

Alternative C - No Action

Under the No-Action alternative, current disposal of irrigation return flows and some storm runoff would continue. Although environmental consequences to socioeconomics are difficult to anticipate, it is likely that agricultural practices will be affected by the closure of drainwells which do not comply with state standards.

3. Mitigation

Alternative A - Integrated Wetlands and Reuse (Preferred Alternative)

The costs of pumping and additional equipment would be mostly passed on to agricultural users of the NSPD under this alternative. It is possible that improvement in wildlife habitat would occur, due to the creation of wetlands and riparian zones. Hunting leases could be used by private land owners as a means to recuperate some of the expenses associated with equipment, power costs, and a slight reduction in arable acreage. The value of a hunter day in 1993 has been approximated from 1982 data to be $60 for waterfowl, $35 for upland game, and $30 for pheasants (personal communication, Gilchrist 1993). A conservative estimated increase of 5,000 annual pheasant hunter days (or 2.7 percent of the state total) would generate $150,000, partly to the local economy. This figure does not include potential revenue generated due to hunting leases.

Alternative B - Irrigation Reuse

No mitigation measures are proposed for this alternative.

Alternative C - No Action

No mitigation measures are proposed for the No-Action alternative.

H. Land Use and Recreation

1. Affected Environment

Land Use

The NSPD is predominantly located in Minidoka County. Forty-two percent of the land in Minidoka County is farmland, which occurs primarily on the Snake River Plain (Minidoka County 1981). Agriculturally based municipalities in the area are also distributed along the Snake River, including the primary towns of Rupert and Burley. Secondary towns in Minidoka County include Paul, Heyburn, Acequia, and Minidoka. The vast majority of the remaining lands are non-irrigated rangeland and dryland pasture.

Of the 480,000 acres in Minidoka County, 51 percent are privately owned, while another 47 percent are public land (University of Idaho 1988). The remaining 2 percent is made up of state, county, and municipal lands. Approximately 77,000 acres are managed as the NSPD by the ABID.

The NSPD is privately owned except for a few parcels of public land withdrawn by Reclamation. A few parcels of BLM land exist in close proximity to withdrawn Reclamation lands in the same area. Beyond the boundaries of the NSPD to the west, north, and east, private ownership abruptly changes to BLM land with Sections 16 and 36 in each township owned by the State of Idaho. The lands bordering Lake Walcott behind Minidoka Dam are public lands administered by the FWS as the Minidoka National Wildlife Refuge.

There are many prime farmlands on the NSPD, as long as they are irrigated, according to the SCS (personal communication, Skyler 1993). These include large acreages of the Portneuf series with slopes of 0 to 2 percent, and 2 to 4 percent. It also includes much smaller acreages of the Declo series with 0 to 2, and 2 to 4 percent slopes; the Escalante fine sandy loam 2 to 4 percent slopes; Kimama silt loam; Minidoka silt loam, 0 to 2 and 2 to 4 percent slopes; and the Portino silt loam 2 to 4 percent slopes. There are many other prime irrigated farmlands in the Minidoka area, which include parts of Minidoka, Blaine, and Lincoln Counties.

Minidoka County has adopted a comprehensive plan to identify the goals, objectives, and policies regarding land use. The purpose of the plan is "to improve the community's ability to adapt to the expected, to create the desirable, and to avoid the undesirable, as defined by the members of that particular community" (Minidoka County 1981). Water management is a central theme in the administration of the plan. Current zoning accommodates commercial, industrial, residential, and agricultural uses in the county. The vast majority of the NSPD is zoned for agricultural uses to retain the economic base of the area, and is designated for the production of food, fiber, and animal products.

The resource conservation element of the comprehensive plan recognizes the importance of water, soil, vegetation, and wildlife to the residents of Minidoka County and the interaction of these resources. It also identifies the economic impact of managing these resources, and the potential beneficial effects that conservation has on the quality of the human environment.

Recreation

Abundant recreation opportunities exist in Minidoka County in the form of city and county parks, boat docks on the Snake River, and nearby Lake Walcott (Minidoka National Wildlife Refuge). Water sports including boating, water skiing, and swimming are popular. Hunting for waterfowl at Lake Walcott, along the Snake River, and on private wetlands is popular from October to December. Hunting for upland game birds such as pheasant, chukar, and sage grouse has declined in recent years (personal communication, Palmer 1993). Estimated hunter days in Minidoka County in 1991 included 6,929 for all upland game, 3,926 for pheasants, and 4,337 for waterfowl, based on IDFG phone surveys. Within the NSPD, there are no developed recreational areas.

2. Environmental Consequences

Alternative A - Integrated Wetlands and Reuse (Preferred Alternative)

Under this alternative, approximately 700 acres would be affected. This acreage would be converted to wetlands through a purchase of flood easements by Reclamation, or through other types of land transactions. The wetlands development would likely affect some prime farmland, especially the Portneuf series which covers large acreages on the NSPD. However, land use plans and regulations would probably not change due to these actions. Recreation would benefit from the development of wetlands particularly in the form of increased hunting opportunities for pheasant, chukar, quail, and other upland game. Waterfowl hunting could be benefitted as well, especially given the close proximity of Lake Walcott, Minidoka National Wildlife Refuge, and the large migratory waterfowl populations present during the spring and fall seasons (personal communication, Collins 1993).

Alternative B - Irrigation Reuse

This alternative would convert 1,000 acres of undeveloped Reclamation lands to farmland and water storage for reuse of irrigation return flows. Some prime farmland would be affected. However, current land use regulations would accommodate these changes in land use patterns. Upland wildlife habitat and recreation in the form of bird hunting would be reduced while these activities on irrigated land would increase; but not to the same extent as with the preferred alterative.

Alternative C - No Action

Under the No-Action alternative, there would be no changes to land use or recreation in the short-term, but there could potentially be major changes in land use if a reduction in the amount of land irrigated became necessary due to problems with attaining water quality standards.

3. Mitigation

Alternative A - Integrated Wetlands and Reuse (Preferred Alternative)

Since only minor, compatible changes in land use would occur under this alternative, no mitigation is proposed. Seven hundred acres would be converted to wetlands; however, wetlands, wildlife habitat, and agriculture are similar and compatible uses. Recreation would receive a beneficial impact due to the proposed action, and would not require mitigation.

Alternative B - Irrigation Reuse

The conversion of 1,000 acres of undeveloped Reclamation lands to farm land and water storage would be compatible changes in land use and no specific mitigation measures are proposed. Some minor improvement in wildlife habitat and hunting potential would also occur which is a beneficial impact and would not require mitigation.

Alternative C - No Action

No mitigation measures are proposed for the No-Action alternative.

IV. CONSULTATION AND COORDINATION

A. Consultation

Reclamation issued a preliminary scoping report on the Drainwater Management Study for the NSPD in September, 1990. The purpose of that report was to compile prior evaluations; identify available data; delineate necessary data collection programs; assess critical legal, statutory, and environmental issues; identify problems, needs, resources, and potential alternative plans; and prepare a plan of study.

In addition, Reclamation initiated a coordination process with the FWS, IDFG, ABID, and BLM. This consisted of a meeting to outline the approach to the analysis, assess the process for identifying wetlands criteria and candidate sites, and establishing further data collection and coordination efforts. This meeting was followed by a summary memorandum to all interested parties and telephone contacts. A subsequent memorandum, dated July 12, 1993, and provided as Appendix E, was also distributed to the agency representatives.

Other agencies and individuals were also contacted in the preparation of this report. They included:

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Paul Aston, Planner, Minidoka County Planning. Rupert, ID.
John Beecham, Research Economist. Boise, ID.
Roger Burnette, Denver, Bureau of Reclamation, CO.
Frank Bowen, Partner, Agri-West Realty. Rupert, ID.
Marti Collins, U.S. Fish and Wildlife Service - Minidoka National Wildlife Refuge, ID.
Ed Crumpy, Resource Recreation and Tourism. University of Idaho, Moscow.
Rick Gilchrist, Wildlife Biologist. Rupert, ID.
Ivan Hopkins, Minidoka County Extension Agent, Cooperative Extension Service. Rupert, ID.
Chris Ketchum, Natural Resource Specialist, Minidoka Project Office, Bureau of Reclamation, ID.
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Virgil Temple, A&B Irrigation District Manager. Rupert, ID.
Helen Thorton, Idaho Department of Water Resources. Boise, ID.
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APPENDIX A

ENVIRONMENTAL COMMITMENTS ASSOCIATED WITH THE PREFERRED ALTERNATIVE

APPENDIX A

ENVIRONMENTAL COMMITMENTS ASSOCIATED WITH THE PREFERRED ALTERNATIVE

1. Reclamation will monitor water quality of wetlands on a regular basis to avoid the accumulation of toxic contaminants that are not eliminated by plant uptake and filtering. Reclamation will adjust water levels, vegetative types and other factors based on water quality monitoring results.

2. Reclamation will monitor injection wells in closed-basin areas to mitigate declining acquifer water levels. A valved drainwell would be closed to contain return flows until contamination is removed and then drains would be opened to allow water to recharge the aquifer.

3. Reclamation will continue to dredge settling ponds as needed to avoid concentrating contaminants in the sediments.

4. Reclamation will develop, maintain and manage wetland sites through construction, seeding, planting and monitoring. Wetland maintenance could include periodic dredging of sediment basins, seeding or planting, and embankment repairs.

5. Reclamation will revegetate disturbed areas as soon as possible to limit erosion and down stream sedimentation. Revegetation of wetland creation sites will include seeding and planting of selected wetland species. Revegetation of upland sites would include seeding and/or planting of native upland species.

6. Reclamation will install water level control structures in created wetlands to maintain water levels for waterfowl feeding, resting, nesting, and brood rearing habitat.

7. Reclamation will post signs at wetland creation sites prohibiting dumping, pumping, shooting, or other activities deemed inappropriate to management objectives.

8. Reclamation will conduct periodic sediment removal without removal of wetland vegetation.

9. Reclamation will control dense stands of cattails. Where appropriate, this may include installation of water level control structures at each permanent wetland site to manipulate water levels for cattail control.

10. Reclamation will conduct Class III cultural surveys, prior to any site specific development of wetlands or reuse systems, for applicable areas that have not previously been surveyed or surveyed using less intensive methods. Furthermore, Reclamation will assure that sites are evaluated for their eligibility to the National Register of Historic Places. Sites found to be eligible after consultation between Reclamation and the SHPO would be avoided or impacts would be minimized through a treatment plan that would be reviewed by the SHPO and the Advisory Council on Historic Preservation.

11. Reclamation will conduct the necessary consultation with Native Americans, prior to any site specific action, concerning the presence of traditional use areas or sacred areas.

APPENDIX B

CLOSURE ALTERNATIVES
FOR
INDIVIDUAL ABID DRAINWELLS

NOTES ON INDIVIDUAL DRAIN WELLS

C DRAIN

32AD 725 Small closed basin. Open, but not receiving drainwater. All lands under sprinkler. Can be permanently closed. Flooding would pond against railroad.

3AD 825 Small closed basin. Open, but not receiving drainwater. All lands under sprinkler. Can be permanently closed. Minor flooding would pond against railroad.

17AD 825 Main drain. Open, but checked off. Occasionally used as needed.

Alternative #1. See alternative listed following 29BD 825.

19AD 825 Small closed basin. Open and in use. Water comes from 19CD.

Alternative #1. Pump back to CD lateral and run out wastewater to C-1 drain and down to C pond.

29AD 825 Located at C pond. Open, but does not appear to be used. Water comes from C main. Can be closed.

29BD 825 Located at C pond. Open and in use. Water comes from C main.

Alternative #1. Check this structure off and see if existing pond is adequate to handle the water. There is a farmer's pump installed in front of this drain well.

Alternative #2. Construct larger storage. Build small pond to channel water to farmers, pump the overflow to large containment pond.

Alternative #3. Construct storage pond in NW 1/4 Sec. 30. Pump to this pond for irrigation of land in Sec. 30.

Alternative #4. Develop wetland in SW 1/4 Sec. 9. Dike across C-6 drain. Could pond approximately 30 surface acres. All Federal land.

Alternative #5. Develop wetland in the SE 1/4, NW 1/4, NE 1/4, and SW 1/4 Sec. 6. At juncture of C main, C-14 and C-13 drains. Lands are privately owned.

D DRAIN

1AD 824 — Open and in use. Water comes from D main.

Alternative #1. Sometime during the summer we need to check this drain well off and see if the water will go down the D main with no flooding of adjacent fields.

13AD 824 — Permanently capped according to state regulations. The structure is still in place.

24AD 824
24CD 824 — Both wells open and in use. Water comes from D main.

Alternative #1. Divert all water from D drain to Sec. 30. Construct holding ponds for wetlands.

24BD 824 — Checked off. Drainwater is going downstream to 24AD 824 and 24CD 824.

25AD 824
25BD 824 — Both wells are open and in use. At present time all drainwater comes from production well 26AB 824 and enters C drain just below county road at 600 N.

Alternative #1. See alternative #1 for drain wells 24AD 824 and 24CD 824.

25CD 824 — Permanently closed. This drain well was closed according to state regulations. No sign of structure.

26AD 724 — Open and in use. Water comes from several locations above here. There is a farmer pump set up in settling pond.

Alternative #1. Build larger containment pond and see if farmer can handle the water.

Alternative #2. Reopen the D main going down through Sec. 36.

E DRAIN

23AD 824	Small closed basin. Open and in use. Drainwater comes from 23A 824 and 22A 824. <u>Alternative #1.</u> Pump back to 22A 824 and divert out wasteway to E main. This was implemented as a pump back/reuse demonstration project.
26AD 824	Open, but inactive. Receives no drainwater. This well can be permanently closed.
27AD 824	Open, but not in use. There is a farmer's pump set on pond downstream from this well. This well is not functional. Can be permanently closed.
28AD 824	This drain well is abandoned. Could not find any sign of it. Drainwater is being pumped from this location over to E pond. This well is recommended for permanent closure.
33AD 824	Has been permanently closed according to state regulations. No sign of structure.

F DRAIN

4AD 823 Small closed basin. Open and in use. Water comes from 5BC 823.

Alternative #1. Pump drainwater to the F-14 drain. The F-14 is farmer maintained and would have to be reopened.

Alternative #2. Pump directly to F main. This would be expensive. About 3/4 mile of pipeline would be required.

Alternative #3. Install pumpback system for farmer to own/operate.

11AD 823 Open and in use.

Alternative #1. Cap this well and retain as a possible production well. Drainwater will flow down F main.

8AD 824 Abandoned and capped. This well will be retained for possible future use as a production well.

9AD 824 Open and in use. Water comes down the F 5-1. This well will be capped and retained for possible future use as a production well.

32AD 824 Inactive. Snorkel still in place, but about half buried. This drain well is located adjacent to the F main. No water has been going to this well for several years. This drain well can be permanently closed.

6AD 924
6BD 924 Both drain wells open and in use. Water comes from F main and MID.

Alternative #1. Relift pumps are located on south side of Cap Hawley Pond. Water can be pumped into the MID B-1 canal.

Alternative #2. Enlarge containment ponds at Cap Hawley.

Alternative #3. Acquire lands at strategic places along the F main drains for wetland development.

Alternative #4. Institute pumpback systems whereby farmers use drainwater in lieu of project well water.

CLOSED BASIN
(G BASIN)

5AD 823 Open and in use. Water comes from 5BC 823.

Alternative #1. Live water is delivered here as well as drainwater. There is a possibility of closing this well if a larger containment was constructed.

Alternative #2. This appears to be high quality water. May meet state standards.

Alternative #3. Approximately 20 acres of Federal land is adjacent to this well. Could dike around this acreage and pump drainwater to the dike area.

8AD 823 Open and in use. Water comes from 8A 823 and the 4AB 823.

Alternative #1. Pump south to head of H main.

Alternative #2. Pump over to 9BD 823 drain which in turn could be pumped over to 4AD 823 lateral and spilled out into F-13 drain.

Alternative #3. Pump directly to 4AB 823 lateral and spill out into F-13 drain.

9AD 823 Open and in use. Drainwater comes from 15AD 823 and 10B 823.

Alternative #1. Pump back to 9BD 823 drain.

Alternative #2. Build larger containment pond for wetland. Appears to have very little water.

9BD 823 Open and in use. Drainwater comes from 8A 823 and 4AB 823.

Alternative #1. Pump back to 4AB 823 lateral and flow out into the F-13. (F drain)

Alternative #2. Possible wetland site. Drain well is adjacent to existing wildlife tract.

10AD 823 Open and in use. Drainwater comes from 4AB 823 and 10A 823.

Alternative #1. Pump north to F main.

10BD 823 Open and in use. Drainwater comes from 4AD 823 and 10A 823.

Alternative #1. Pump and pipe to 10AD 823 which in turn would pump to F main.

10CD 823 Open and in use. Drainwater comes from 10A 823, 10B 823 and 15AB 823.

Alternative #1. Pump to 10BD 823 and then to 10AD 823 and then to F main.

Alternative #2. Build larger containment pond and utilize water at 15AB 823 with pump back system if supply is great enough.

10DD 823 Open, but inactive. Receives only flood runoff. Could permanently close.

14AD 823 Open and in use. Drainwater comes from the 15D 823, 14AD 823 and 23AB 823.

Alternative #1. Already has farmer pump set up in sump. Check off and see if farmer can utilize all water.

Alternative #2. Pump up to 14AB and divert over to the F main.

14BD 823 Open and in use. Drainwater comes from 14AB 823, 15D 823 and 15AB 823.

Alternative #1. Pump back to 14AB 823 and flow out to the F main.

Alternative #2. Run out end of 14AB over to the 14AD drain well where farmer has a pump set up.

21AD 823 Open and in use. Drainwater comes from 17AB 823, 29AB 823, and 21A 823.

Alternative #1. Could pump back to 17AB 823 drain and run out into H main.

Alternative #2. Pump to 21A 823 and run out into the 27AD 823 for pumping back to 27C.

21BD 832 Open and in use. Drainwater comes from 10B 823, 15AB 823, and 21A 823.

Alternative #1. Could check this structure off and run water down existing drain to 21CD 823.

21CD 823 Open and in use. Drainwater comes from 21A 823, 10B 823, and 15AB 823.

Alternative #1. Pump to 21A 823. If could not utilize here, we could run out into 27BD then pump back to 27C 823.

Alternative #2. Pump east to 22BD 823-W drain and run to the 22BDFD pond.

22AD 823 Open and in use. Drainwater comes from 21A 823, 10B 823, and 15AB 823.

Alternative #1. Same as 21CD 923.

22BD 823
22FD 823 Both wells open and in use. Water comes from 15AB 823, 23AB 823, 15D 823, 22A 823 and 21A 823.

Alternative #1. Pump to production well 2ZA 823 for reuse.

Alternative #2. Set up farmer pumpback system.

22CD 823 Open and in use. Water comes from 15AB 823.

Alternative #1. Pump back to 15AB 823 interconnect.

Alternative #2. Pump to 22FD pond.

22DD 823 Open and in use. Drainwater comes from 22A 823 and 23AB 823.

Alternative #1. Pump to 27AB 823 production well.

Alternative #2. Pump to 22ED 823 drain well.

22ED 823 Open and in use. Drainwater comes for 23AB 823 and 22A 823.

Alternative #1. Pump back could be made to 22A 823 or 23AB 823 with emphasis placed on 23AB because of more water use.

Alternative #2. Pump to 22DD 823 for repumping to 27AB 823.

25AD 823 Open and in use. Drainwater comes from 25A 823 and 26A 823. Farmer has pump in settling pond and has been handling most of the water at present.

Alternative #1. Construct larger holding pond and see if farmer can handle all water.

25BD 823 Open and in use. Drainwater comes from 25A 823 and 24AB 823.

Alternative #1. Pump back to 24AB 823-1.2 sublateral wasteway and run to the F-4 drain.

Alternative #2. Farmer pumpback system.

Alternative #3. Pump to 25AB 823 production well.

25CD 823 Structure still in place and filled with dirt. Farmer's pump setting inside of structure. AD drain well is in same settling pool. This well can be permanently closed as the AD and farmer's pump has been handling the water.

26AD 823 Open and in use. Drainwater comes from 26A 823 and 27A 823.

Alternative #1. Pump back to 26A 823.

Alternative #2. Set up farmer sprinkler pump in settling pond.

26BD 823 Open and in use. Drainwater comes from 26A 823, 27A 823 and 23AB 823.

Alternative #1. Pump back to 27A 823. Overflow could go to 34ED.

Alternative #2. Pump back to 26A 823.

26CD 823
26DD 823 Both wells open and in use. Water comes from 26A 823 and 23AB 823 and a small amount from 25A 823.

Alternative #1. Pump back to 24AB 823.

Alternative #2. Pump over to 25AB 823. Overflow could then go to the F main.

27AD 823
27BD 823 Both wells open and in use. Water comes from 22A 823, 21A 823, 27C 823 and 27B 823.

Alternative #1. Pump to the 27C 823 and if not able to utilize it here, it could overflow to the 34ED.

Alternative #2. Pump to 27B 823 and overflow to the 34ED.

Alternative #3. Install farmer pumpback system.

Alternative #4. Acquire acreage around well for wetland.

28AD 823 Open and in use. Water comes from the 29AB 823.

Alternative #1. Pump from pond over to 29AB 823 pool and overflow out wasteway to H main.

28BD 823 Open and in use. Drainwater comes from 28AB 823 and 29AB 823.

Alternative #1. Pump southwest to 28AB 823 lateral and dump out the end to 4CD 923.

Alternative #2. Pump northeast to 27AD 823 drain.

34AD 823 Inactive. All lands sprinkled. Can be closed.

34BD 823 Open, but not active. This drain well can be closed.

26AD 823 Open and in use. Drainwater comes from 26A 823 and 27A 823.

<u>Alternative #1.</u> Pump back to 26A 823.

<u>Alternative #2.</u> Set up farmer sprinkler pump in settling pond.

26BD 823 Open and in use. Drainwater comes from 26A 823, 27A 823 and 23AB 823.

<u>Alternative #1.</u> Pump back to 27A 823. Overflow could go to 34ED.

<u>Alternative #2.</u> Pump back to 26A 823.

26CD 823
26DD 823 Both wells open and in use. Water comes from 26A 823 and 23AB 823 and a small amount from 25A 823.

<u>Alternative #1.</u> Pump back to 24AB 823.

<u>Alternative #2.</u> Pump over to 25AB 823. Overflow could then go to the F main.

27AD 823
27BD 823 Both wells open and in use. Water comes from 22A 823, 21A 823, 27C 823 and 27B 823.

<u>Alternative #1.</u> Pump to the 27C 823 and if not able to utilize it here, it could overflow to the 34ED.

<u>Alternative #2.</u> Pump to 27B 823 and overflow to the 34ED.

<u>Alternative #3.</u> Install farmer pumpback system.

<u>Alternative #4.</u> Acquire acreage around well for wetland.

28AD 823 Open and in use. Water comes from the 29AB 823.

<u>Alternative #1.</u> Pump from pond over to 29AB 823 pool and overflow out wasteway to H main.

28BD 823 Open and in use. Drainwater comes from 28AB 823 and 29AB 823.

<u>Alternative #1.</u> Pump southwest to 28AB 823 lateral and dump out the end to 4CD 923.

<u>Alternative #2.</u> Pump northeast to 27AD 823 drain.

34AD 823 Inactive. All lands sprinkled. Can be closed.

34BD 823 Open, but not active. This drain well can be closed.

34CD 823 Open and in use. Drainwater comes from 27B 823, 34A 823, and 35C 823.

Alternative #1. Pump to 34ED.

Alternative #2. Pump to 34A 823C.

34DD 823 Open and in use. Water comes from the 34A 823.

Alternative #1. Pump back to 34A 823.

Alternative #2. Pump west to 4CD 923-E drain.

34ED 823 Open and in use. Drainwater comes for 27AC 823, 27B 823 and 35A 823.

Alternative #1. Construct larger containment pond and set farmer's sprinkler pump up in it.

Alternative #2. Pump to 35A 823.

35AD 823 Open and structure still in place. AD and CD are in the same pond. The AD well can be permanently closed.

35BD 823 Inactive. Structure still in place, but filled with dirt. Receives no drainwater. Can be permanently closed.

35CD 823 Open and in use. Water comes from 35A 823.

Alternative #1. Pump back to 35A 823.

31AD 923 Inactive. Structure still in place. Receives no drainwater. This well can be permanently closed.

2AD 923 Inactive. Farmer's pump set up in pond where drain well supposed to be. Can be permanently closed.

4AD 923 Inactive and abandoned. This well can be permanently closed.

4CD 923 Open and in use. Drainwater to this well comes from 3A 923, 34A 823, and 28AB 823.

Alternative #1. Water could be pumped over to H main drain.

Alternative #2. Farmer irrigation pump.

H DRAIN

4 BD 923 — Open, but checked off. Water comes from several different sources as this well is located towards the terminus of the H drainage system.

Alternative #1. Increase irrigation from existing pond. Any excess water will overflow from this pond downstream to the 5AD 923 drain well. This well can be permanently closed.

Alternative #2. Fill in the main drain. Restore natural contour. Revegetate. Create wetlands.

5AD 923 — Open, but not receiving drainwater. All lands above being sprinkled.

Alternative #1. Construct dike just below drain well. This will control any drainwater flowing downstream from the irrigation pond just below the 5AD 923 drain well.

J DRAIN

12AD 922 — Open and in use. Drainwater comes from 11C 922 and 35AD 822.

Alternative #1. This pond has a headgate going out of it into a drain then into a pipe which goes to MID's canal. Should check to see if MID can handle all the water.

Alternative #2. Construct containment dike downstream in Fish and Game area.

Alternative #3. Acquire reservoir ROW and raise the dam increasing reservoir surface area.

Alternative #4. Install farmer irrigation pump.

K DRAIN

11AD 922 — Open and in use. Drainwater comes from 3AB 922 and 11BC 922. Almost no drainwater flowing at this time.

Alternative #1. Construct larger containment pond.

Alternative #2. Construct containment pond in the NW 1/4, NW 1/4 Sec. 13.

N DRAIN

17AD 922 Inactive. The drain well structure is still in place. The casing for this well has a temporary cap welded on top to close it. There is no water to this well except possible for runoff in spring. This well will be retained as a possible future production well.

26AD 922 Inactive. Capped by MID. Drain well structure is still in place.

P DRAIN

33AD 922 Open and in use. Water draining to this well comes from the G 3.9-12.3 lateral. Following is alternative that could be considered if we had to close.

Alternatives #1. Pump to 33BC 922 lateral and divert west to D-5 drain or down the lateral toward the west yard where lateral overflow would take it to MID canal 20.

Q DRAIN

10AD 1022 Inactive. Permanently capped. This drain well was covered by the interstate.

13AD 1021 Open and in use. Water comes form main canal and the D lateral.

Alternative #1. Activate and maintain the relift pump which pumps south to the unit A main canal.

T DRAIN

3AD 1022 Open and in use. Water comes from F lateral and the 3A 1022. All lands sprinkled receiving almost no drainwater.

Alternative #1. Pump up to the 3A 1022 lateral and run the water down the wasteway to the S pond.

Alternative #2. Acquire small acreage for wetland.

APPENDIX C

MINIDOKA NATIONAL WILDLIFE REFUGE - MAMMAL LIST

APPENDIX C

MAMMAL LIST MINIDOKA NATIONAL WILDLIFE REFUGE - 1975

Masked Shrew[2] (*Sorex cinerus*)

Vagrant Shrew[1] (*Sorex vagrans*)

Dusky Shrew (*Sorex obscurus*)

Northern Water Shrew[2] (*Sorex palustris*)

Spotted Bat[2] (*Euderma maculata*)

Little Brown Myotis[1] (*Myotis lucifugus*)

Long-eared Myotis[2] (*Myotis evotis*)

Yuma Myotis (*Myotis yumanensis*)

Small-footed Myotis (*Myotis subulatus*)

Fringed Myotis (*Myotis thysanodes*)

California Myotis (*Myotis californicus*)

Pallid Bat (*Antrozous pallidus*)

Big Brown Bat (*Eptesicus fuscus*)

Big Freetail Bat (*Tadarida malossa*)

Raccoon[1] (*Procyon lotor*)

Shorttail Weasel[1] (*Mustela erminea*)

Longtail Weasel (*Mustela frenata*)

Mink[1] (*Mustela vison*)

Striped Skunk[1] (*Mephitis mephitis*)

Porcupine[1] (*Erethizon dorsatum*)

Badger[1] (*Taxidea taxus*)

River Otter[1] (rare) (*Lutra canadensis*)

Coyote[1] (*Canis latrans*)

Bobcat[1] (*Lynx rufus*)

Beaver[1] (*Castor canadensis*)

Golden-mantled Ground Squirrel[1] (*Citellus lateralis*)

Yellowbelly Mammot[1] (*Marmota flaviventris*)

Minta Ground Squirrel[1] (*Citellus armatus*)

Townsend Ground Squirrel[2] (*Citellus townsendi*)

Richardson Ground Squirrel (*Citellus richardsoni*)

Northern Pocket Gopher[1] (*Thomomys talpoides*)

Ord Kangaroo Rat[1] (*Dipodomys ordi*)

Great Basin Kangaroo Rat[2] (*Dipodomys microps*)

Northern Grasshopper Mouse[2] (*Onychomys leucogaster*)

Western Harvest Mouse[1] (*Reithrodontomys megatotis*)

Deer Mouse[1] (*Peromyscus maniculatus*)

Great Basin Pocket Mouse[2] (*Perognathus parvus*)

Bushytail Woodrat (*Neotoma cinerea*)

Desert Woodrat[2] (*Neotoma lepida*)

Sagebrush Vole[1] (*Microtus longicaudus*)

Longtail Vole (*Microtus longicaudus*)

Muskrat[1] (*Ondatra zibethica*)

Pygmy Rabbit (*Sylvilagus idahoensis*)

Cottontail Rabbit[1] (*Sylvilagus nuttalli*)

Blacktail Jackrabbit[1] (*Lepus californicus*)

Whitetail Jackrabbit (*Lepus townsendi*)

Mule Deer[1] (*Odocoileus hemionus*)

Pronghorn Antelope[1] (*Antilocarpa americana*)

Notes: 1. Identified in the field
2. Range may include Minidoka NWR

Source: Minidoka National Wildlife Refuge

APPENDIX D

MINIDOKA NATIONAL WILDLIFE REFUGE - REPTILE LIST

APPENDIX D

REPTILE LIST MINIDOKA NATIONAL WILDLIFE REFUGE - NO DATE

Great Basin Whiptail (*Species unknown*)

Western Skink[1] (*Eumeces skiltonianus*)

Desert Horned Lizard[1] (*Phrynosoma platyrhinos*)

Pygmy Horned Lizard[1] (*Species unknown*)

Great Basin Fence Lizard (*Sceloporus occidentalis longipes*)

Northern Sagebrush Lizard (*Sceloporus graciosus graciosus*)

Long-nosed Leopard Lizard[1] (*Gambelia wislizenii*)

Collared Lizard (*Crotaphytus spp.*)

Western Fence Lizard[1] (*Sceloporus occidentalis*)

Common Garter Snake[1] (*Thamnophis sirtalis*)

Western Garter Snake[1]

Desert Night Snake (*Hypsiglena torguata*)

Western Rattlesnake[1] (*Crotalus viridis*)

Great Basin Gopher Snake[1] (*Pituophis melanoleucus*)

Western Yellow-bellied Racer[1] (*Coluber constrictor*)

Striped Whipsnake (*Masticophis taeniatus*)

Rubber Boa[1] (*Charina bottae*)

Note: 1. Identified in the field

Source: Minidoka National Wildlife Refuge

APPENDIX E

COORDINATION MEMORANDUM
DATED JULY 12, 1993

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION
MEMORANDUM

TO: Bob Adair (USBOR)

CC: Tony Apa (IDFG)
John Augsburger (USBLM)
Sheri Freemuth (SAIC)
Chris Ketchum (USBOR)
Susan Martin (USFWS)

FROM: Robert J. Henke (SAIC) RJH

DATE: July 12, 1993

SUBJECT: U.S. Bureau of Reclamation North Side Drain Water ER: Wetland Criteria and Candidate Wetland Sites: Revision 01.

Task 12 from the scope of work identified in the proposal for the North Side Drain Water Management Plan Environmental Report indicates that Science Applications International Corporation (SAIC) will define criteria and/or candidate sites for both permanent and temporary wetlands for Alternative A of the Management Plan. This memorandum is submitted as the deliverable for Task 12. As identified in the scope of work and through discussions with U.S. Bureau of Reclamation (USBOR) personnel, SAIC will not identify site specific locations for creation of temporary and/or permanent wetlands. Site specific selection of wetland creation sites is outside the current scope of work. Instead, the current memorandum identifies criteria for general selection of suitable areas for wetland creation. In addition, general areas within the A&B Irrigation District (ABID) drains are discussed as candidate sites for wetland creation.

Based on discussions with Virgil Temple, ABID, SAIC concentrated the field reconnaissance for the current project on drains A, B, C, D, E, and F. It was determined, through conversations with ABID and USBOR personnel, and by the site visit, that biological resources and injection wells within these drains were representative of all drains within the ABID.

A field reconnaissance was conducted of the ABID study area from June 8 to 10, 1993, in Minidoka County, Idaho. A project kickoff meeting and agency coordination meeting were held on June 7, 1993 and June 11, 1993 respectively in Boise, Idaho. The following discussion is based on these meetings and the field reconnaissance.

1.0 WETLAND CRITERIA

Wetland criteria are defined as physical, chemical, or biological attributes or characteristics of the study area that can be used to identify suitable sites for development of temporary or permanent wetlands using agriculture irrigation tail water. Wetland criteria include those attributes that make it feasible to create wetlands from drainwater that is currently disposed of in ground water injection wells.

For the purpose of this study, temporary wetlands are defined as those areas exhibiting a predominance of wetland vegetation and providing wetland functions (e.g., wildlife habitat, sediment removal) only during seasons or years when adequate agricultural irrigation return flows are available. Temporary wetlands also include those wetland habitats created but, through lack of maintenance, revert to upland habitat. Temporary wetlands could include small, closed basin or drain associated wetlands without permanent wetland hydrology or without sufficient maintenance.

Permanent wetlands are defined as those areas that continually exhibit a predominance of wetland vegetation and provide wetland functions regardless of the irrigation return flows for a particular year. Permanent wetlands include self-maintaining habitat located at the terminus of main drains or in closed basins with sufficient watershed to provide permanent wetland hydrology.

Water management activities within the ABID contribute to the classification of either temporary or permanent wetlands. Wetlands that are used to store irrigation return flows for future reuse as agricultural irrigation water could be considered temporary wetlands if the removal of water diminishes the value or functions provided by a wetland. Wetlands relying on flood irrigation basins for their hydrology may also be considered temporary if water conservation efforts, (including improved water management and a change to sprinkler irrigation), significantly reduces the flow and volume of irrigation return flows. Small created wetlands may also be considered temporary if lack of management (e.g., sediment removal) results in diminished value and/or loss of wetland functions.

1.1 Criteria

Primary physical criteria used in the selection of wetland creation sites include the slope, soil, size, water depth, and water availability of the site. Shallow slopes, less than 15 percent, are generally best for permanent wetland creation sites. Extensive cut and fill are required to create and maintain permanent wetlands at sites with steep slopes. Temporary wetlands can occur on steep slopes; however, these sites may be subject to soil erosion and downstream wetlands could experience increased sedimentation. Topography or slope may also be a consideration for equipment access to a candidate wetland creation site. If the creation site is less than 15 percent slope but construction equipment access is prohibited by adjacent topography, the area may not be suitable for wetland creation and maintenance.

Highly permeable soils are also generally not suitable for wetland creation sites, except when combined with high water loading rates, because water does not stay within the root zone of the vegetation for a duration suitable for anaerobic conditions required by wetland vegetation. While hydric soils are optimum for wetland creation sites, poorly drained soils or soils with a high water table are also suitable. Non-hydric soils are less critical for wetland creation if the site can by inundated or saturated for extended periods (e.g. greater than 2 consecutive weeks) during the growing season or the site is a temporary wetland. It is also possible to import clay or other materials to reduce the permeability of candidate wetland creation sites. This alternative is often expensive and should be considered on a site by site basis.

Small areas (e.g. less than 1 acre for palustrine and less than 10-feet-wide for riparian wetlands) are generally not suitable for permanent wetland creation sites. These small sites are generally not economically feasible for wetland creation and may not accommodate large water volumes or flows.

Water depth is an important attribute for consideration of wetland creation. Jurisdictional wetlands generally do not include deepwater aquatic habitat, which is defined as an area permanently inundated with an average annual water depth in excess of 6.6 feet, or if the site is less than 6.6 feet then the area must not support rooted-emergent or woody plant species. Water depth is commonly utilized as a management tool to enhance specific wetland vegetation (e.g, emergents versus submerged aquatics) and to provide habitat for specific species of wildlife (e.g, mudflats for shorebirds and open water for brood rearing or loafing habitat for waterfowl). Water depth for wetlands created within the North Side Drain study area will generally be shallow wetlands ranging from a few inches to 2-4 feet in depth.

Water availability is also an important criteria for selection of wetland creation sites. Sites without sufficient water to inundate or saturate wetland creation sites for a least 2 consecutive weeks during the growing season are probably not suitable for permanent wetlands. An unpredictable or highly variable water supply would probably be more suitable for temporary wetlands. When water is available, temporary wetlands could provide reasonable value for a variety of functions. In years or seasons when water is unavailable or minimal, temporary wetlands would probably provide minimal value.

Chemical criteria used in the selection of wetland creation sites include water quality parameters of irrigation return flows. Wetlands can be designed to remove or reduce levels of organic and inorganic constituents in irrigation return flows through filtration and/or uptake by wetland vegetation. The U.S. Fish and Wildlife Service (USFWS) has conducted a contaminant study of water, sediment, and biota in wetlands located at the terminus of C and E Main drains. Results of this study indicated that while aluminum, zinc, and cadmium were detected at slightly elevated levels, none of the samples taken exceeded criteria for the protection of aquatic life (Mullins and Burch, 1991).

The USFWS is currently participating in a interagency wetland demonstration project on H Drain. The objectives of this demonstration project are to create functioning wetland habitat, improve irrigation return flow water quality in H Drain, and monitor trace elements and organochlorine compound levels flowing into and out of the demonstration wetland to determine if toxic levels would occur.

The interagency wetland demonstration project incorporates design criteria to achieve these objectives. A sediment basin is located at the upstream end of the wetland to reduce water velocity and induce sedimentation. Periodic removal of sediment from the sediment basin would maintain the function of the basin and avoid dredging of downstream wetlands.

Additional wetland design criteria include water depth and water control structures. Water depth is important to maintain certain wetland functions, including the function of pumping water out of sacrifice wetlands for irrigation water reuse. Most permanent wetlands will maintain a relatively constant water depth and will not be subjected to pumping for irrigation water reuse. Any wetlands designed for possible irrigation reuse should include holding ponds with sufficient depth for continuous pumping. Created permanent wetlands should also have water control structures to regulate the water depth and to drain wetlands for periodic maintenance.

1.2 Management

Selection of candidate wetland sites should consider the number and type of wetlands that can be practically developed and managed. For example, numerous small permanent wetlands throughout the ABID could be problematic to develop and manage. Development and management of permanent wetlands can include construction, seeding, planting, monitoring, and maintenance. Wetland maintenance could include periodic dredging of sediment basins, seeding or planting, and embankment repairs.

Management of permanent wetlands may also include periodic site visits and signage to prohibit trash dumping and pumping for irrigation.

1.3 Other Criteria

Other criteria that may be considered for site specific selection of wetland creation sites include land ownership, land use, proximity to utilities, and feasibility of irrigation reuse option. These criteria are not discussed in the memorandum but should be examined prior to site specific location of wetland creation sites. Land ownership, land use, proximity to utilities, and the feasibility of irrigation reuse could influence the feasibility of wetland creation at some sites.

2.0 WETLAND CANDIDATE SITES

Candidate wetland creation sites that meet the above criteria include numerous areas within the study area. Candidate wetland sites are categorized by location within the drainage systems of the ABID and include: (1) terminal main drain wetlands (terminal); (2) mid-main drain wetlands (mid-main); and (3) closed basin wetlands (closed basin). Terminal and mid-main wetlands could primarily be considered permanent wetlands. Closed basin drains could support either temporary or permanent wetlands but should probably be managed as temporary wetlands.

2.1 Terminal Main Drain Wetlands

Terminal wetlands can be created at the terminus of main drains. Examples of existing terminal wetlands in ABID include Cap Hawley and E-Pond. Sufficient water and drainage area appears available for permanent wetland creation sites at the terminus of other main drains as well. Terminal wetlands could be created by construction of earth embankment pond and sedimentation pond wetlands as identified in Figures 1 and 2 of the Drain Water Management Plan. These wetlands would require periodic sediment removal to maintain their functions and values.

2.2 Mid-Main Drain Wetlands

Permanent wetlands can also be created approximately mid-way along main drains. These mid-main wetlands could impound tail and storm waters and be used as irrigation water re-use holding ponds. Mid-main wetlands could accommodate drainage of the watershed up gradient and release water to down gradient wetlands as needed. Tail water down gradient from mid-main wetlands would still require a terminal wetland or possibly a series of riparian wetlands to accommodate tail water. Construction and maintenance of mid-main drains would be similar to that identified in Section 2.1 Terminal Main Drain Wetlands.

2.3 Closed Basin Wetlands

Creation of closed basin wetlands from closure of existing ground water injection wells without a surface outlet could create temporary and permanent wetlands. These wetlands may require some embankment construction to confine irrigation tail water and minimize flooding adjacent agricultural fields. If embankments are not a practical alternative, creation of an emergent zone of wetland vegetation around existing injection wells may also be considered. This emergent zone could act as a filter strip to reduce sedimentation and improve associated water quality concerns. If filter strips prove effective in improving water quality at these locations it may be possible to acquire permits for selected closed basin injection wells. Permits may require periodic monitoring of water quality to ensure the effectiveness of filter strips. It may also be possible to utilize the closed basin as a sediment basin and relocate the injection well inlet to a predetermined elevation above the lowest point in the closed basin. This would permit the emergent zone to filter some sediment and the remaining sediment passing through this zone would be allowed to settle in the sediment basin at the lowest point in the watershed. Following sedimentation, the injection well could be operated to reduce the water level to the desired level.

Seeding and planting of wetland vegetation is not recommended within the sedimentation basis of closed basin wetlands due to the unreliable nature of the hydrologic component of this wetland type. If sufficient water is available for closed basin wetlands during the growing season, wetland vegetation could occur by natural means. It may also be possible to farm temporary closed basin wetlands during dry years.

REFERENCES

Mullins, W.H. and S.A. Burch. 1991. Contaminants in Water, Sediment, and Biota North Side Pumping Division Minidoka Project, Idaho. U.S. Fish and Wildlife Service Environmental Contaminants Division Boise, Idaho.

APPENDIX F

MEMORANDUM
TO U.S. BUREAU OF RECLAMATION
FROM U.S. FISH & WILDLIFE SERVICE

ORIGINAL

USBR-80

FOLDER ID

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Boise Field Station
4696 Overland Road, Room 576
Boise, Idaho 83705

May 25, 1993

150
151 RCC 5/28
151A 5/28
150C
FILE

Memorandum

To: Regional Environmental Officer, Bureau of Reclamation, Boise, Idaho

From: Field Supervisor, Boise Field Office, Boise, Idaho

Subject: Species List for North Side Pumping Division Drainwater Management Program (SP# 1-4-93-SP-372/File # 1009.2300)

The U.S. Fish and Wildlife Service (Service) is providing you with a list of endangered, threatened, candidate, and/or proposed species which may be present in the North Side Pumping Division Drainwater Management project area. You requested this species list in a letter dated May 5, 1993, received by this office on May 6, 1993. This list fulfills requirements under Section 7(c) of the Endangered Species Act of 1973 (Act), as amended. The requirements for Federal agency compliance under the Act are outlined in Enclosure 2. If the project is not started within 180 days of this letter, regulations require that you request an updated list. Please refer to the number shown on the list (Enclosure 1) in all correspondence and reports.

Section 7 of the Act requires Federal agencies to assure that their actions are not likely to jeopardize the continued existence of endangered or threatened species. If a listed species appears on Enclosure 1, agencies are required to prepare a Biological Assessment. It would be prudent for you to consult informally with the Service in development of any Biological Assessment. If you determine that a listed species is likely to be affected adversely by the proposed project, the Act requires that you request formal Section 7 consultation through this office. If a proposed species is likely to be jeopardized by a Federal action, regulations require a conference between the Federal agency and the Service.

Candidate species that appear on Enclosure 1 have no protection under the Act, but are included for your early planning consideration. Candidate species could be proposed or listed during the project planning period, and would then be covered under Section 7 of the Act. The Service advises an evaluation of potential effects on proposed and/or candidate species that may occur in the project area. It may be necessary for you to conduct surveys of the project area to determine the presence or absence and status of candidate species. If it is likely the project will adversely affect a candidate species, we recommend you consult informally with this office.

If you have any questions regarding Federal consultation responsibilities under the Act, please contact Helen Ulmschneider of this office at 208/334-1931. Thank you for your continued interest in the Endangered Species Act.

Sincerely,

Charles H. Lobdell
Field Supervisor

Enclosures

cc: IDFG, Region 3, Nampa

ENCLOSURE 1

LISTED AND PROPOSED ENDANGERED AND THREATENED SPECIES, AND CANDIDATE SPECIES, THAT MAY OCCUR WITHIN THE AREA OF THE NORTH SIDE PUMPING DIVISION DRAINWATER MANAGEMENT PROJECT
FWS-1-4-93-SP-372

LISTED SPECIES	COMMENTS
Bliss Rapids Snail (undescribed species)	Within known range
Utah Valvata Snail (*Valvata utahensis*)	Within known range
Idaho Springsnail (*Pyrgulopsis idahoensis*)	
Banbury Springs Limpet (*Lanx sp.*)	
Snake River Physa Snail (*Physa natricina*)	Within known range
Bald Eagle (*Haliaeetus leucocephalus*)	Wintering area

PROPOSED SPECIES

None

CANDIDATE SPECIES

Pygmy Rabbit (C2)
(*Brachylagus idahoensis*)

Idaho Dunes Tiger Beetle (C2)
(*Cincindela arenicola*)

GENERAL COMMENTS

C2 = Category 2 Taxa for which information now in possession of the U.S. Fish and Wildlife Service indicates that proposing to list as endangered or threatened is possibly appropriate, but for which conclusive data on biological vulnerability and threat are not currently available to support proposed rules. Further biological research and field study may be needed to ascertain the status of taxa in this category.

ENCLOSURE 2

FEDERAL AGENCIES' RESPONSIBILITY UNDER SECTIONS 7(a) AND (c) OF THE ENDANGERED SPECIES ACT

SECTION 7(a) - Consultation/Conference

Requires: 1) Federal agencies to utilize their authorities to carry out programs to conserve endangered and threatened species;

2) Consultation with FWS when a Federal action may affect a listed endangered or threatened species to insure that any action authorized, funded or carried out by a Federal agency is not likely to jeopardize the continued existence of listed species; or result in destruction or adverse modification of critical habitat. The process is initiated by the Federal agency after determining the action may affect a listed species; and

3) Conference with FWS when a Federal action is likely to jeopardize the continued existence of a proposed species or result in destruction or adverse modification of proposed critical habitat.

SECTION 7(c) - Biological Assessment for Major Construction Activities [1/]

Requires Federal agencies or their designees to prepare Biological Assessment (BA) for major construction activities. The BA analyzes the effects of the action[2/] on listed and proposed species. The process begins with a Federal agency in requesting from FWS a list of proposed and listed threatened and endangered species (list attached). If the BA is not initiated within 90 days of receipt of the species list, the accuracy of the species list should be informally verified with our Service. The BA should be completed within 180 days after its initiation (or within such a time period as is mutually agreeable). No irreversible commitment of resources is to be made during the BA process which would foreclose reasonable and prudent alternatives to protect endangered species. Planning, design, and administrative actions may be taken; however, no construction may begin.

We recommend the following for inclusion in the BA; an onsite inspection of the area to be affected by the proposal which may include a detailed survey of the area to determine if the species are present; a review of literature and scientific data to determine species' distribution, habitat needs, and other biological requirements; interviews with experts, including those within FWS, State conservation departments, universities and others who may have data not yet published in scientific literature; an analysis of the effects of the proposal on the species in terms of individuals and populations, including consideration of cumulative effects of the proposal on the species and its habitat; an analysis of alternative actions considered. The BA should document the results, including a discussion of study methods used, any problems encountered, and other relevant information. The BA should conclude whether or not a listed or proposed species will be affected. Upon completion, the BA should be forwarded to our office.

[1/] A major construction activity is a construction project (or other undertaking having similar physical impacts) which is a major action significantly affecting the quality of human environment as referred to in the NEPA (42 U.S.C. 4332 (2)(c).

[2/] "Effects of the action" refers to the direct and indirect effects on an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action.